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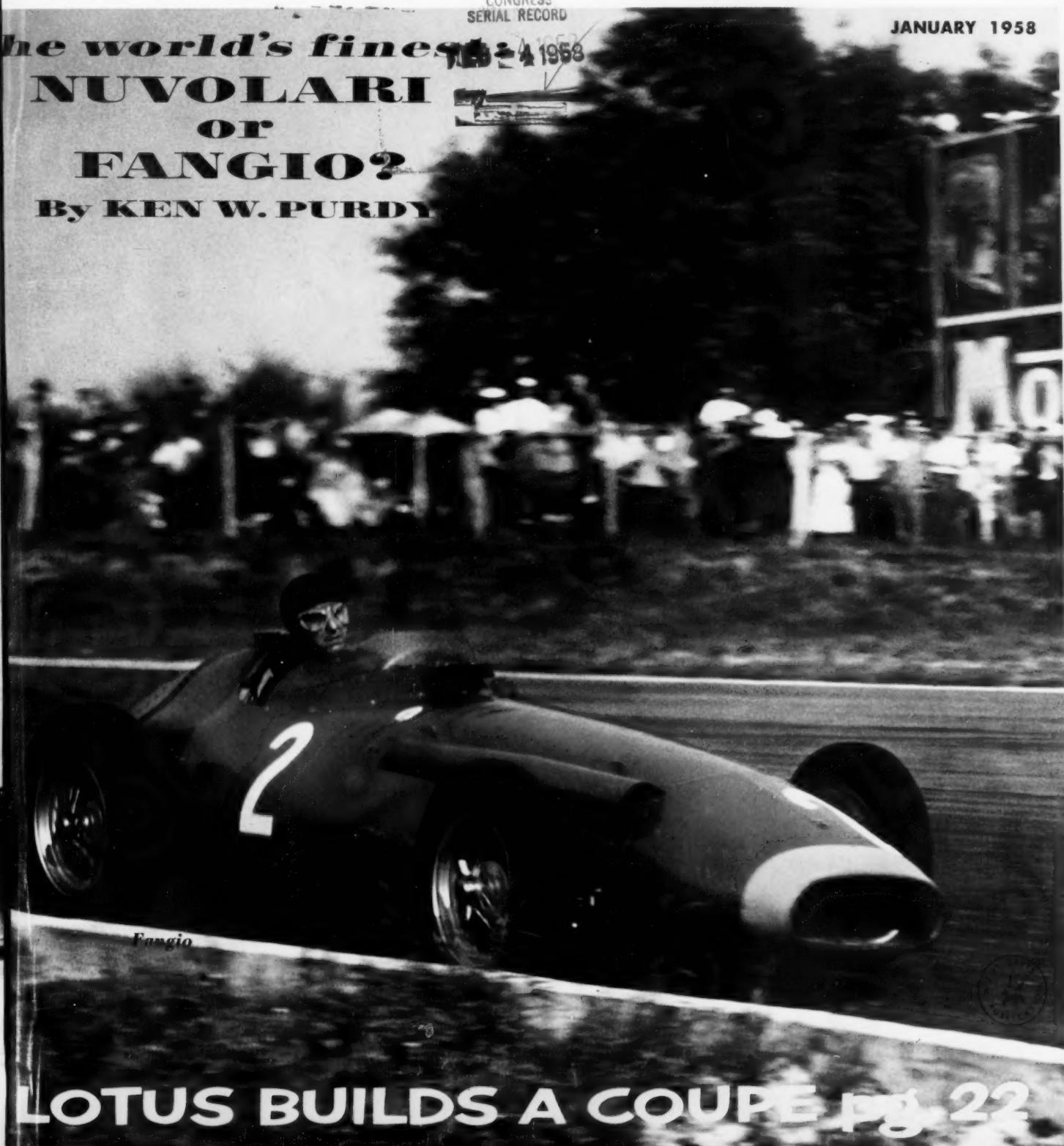
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By KEN W. PURDY



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january 1958
no. 7 vol. 3

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The man on the cover is J. M. Fangio, who happens to be the best race driver living. Is he the greatest ever? See page 14. Photo by Jesse L. Alexander.

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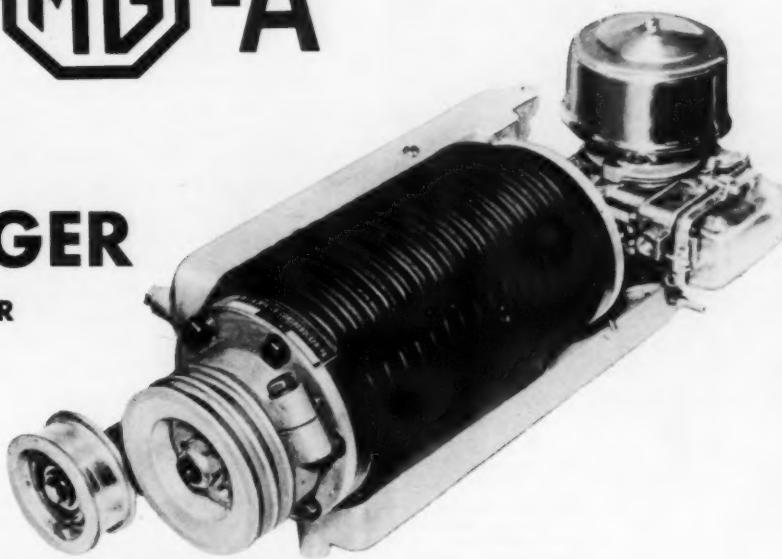
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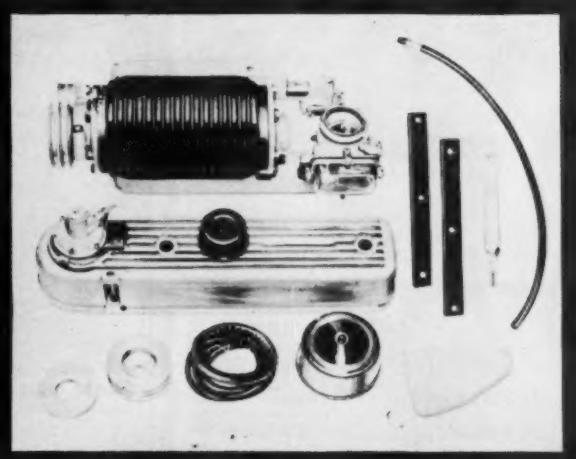
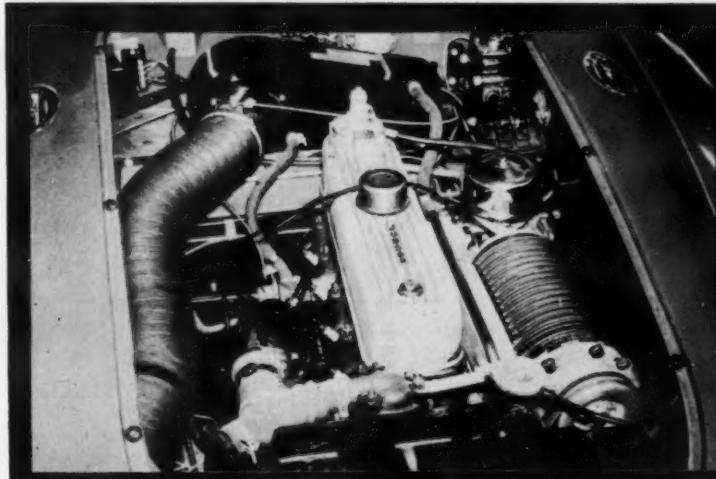
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very sincerely yours:

It was December, 1945. The greatest of all world wars had ended and Christmas lights were glowing at last over most of the Christian world. But all was not peace in Chicago that Christmas twelve years ago.

In a small apartment on Chicago's North Side a young woman lay dead. Hers was not a pretty end nor even a quietly mean one. She had met one of the most twisted psychopathic killers the city had ever known and had screamed her life away in a red fury of knife blows at his hands. We need not dwell upon details as gruesome as these but suffice it to say that they were horrible enough to prove beyond a doubt that the brain that directed the hand that held the knife was a ghastly thing, perverted and tangled, lucid and painful one moment—a raging, horrid inferno the next.

On the wall above the tattered thing that had been a girl, in letters more red than the blood that stained the room, were scrawled in lipstick the words which read in part:

"Stop me before I kill again."

They were words that derived from the mind described above, words that were indicative of the agony in which a young psychotic named William Heirens lived—and sometimes killed.

Last November almost the same words were used as a title on an article in the *Saturday Evening Post*: "Stop us before we kill again." These words were put in the mouth of one of the kindest, sanest drivers in the sport of motor racing now alive—Piero Taruffi—by an editor on the staff of one of the most widely circulated mass magazines in America—perhaps the world.

The article that followed was a shocking, blanket indictment of the sport of motor racing. By-lined by Taruffi—whose English is at best indifferent—it also carried the as-told-to by-line of a noted writer.

The basic theme of the article was ostensibly a plea for the abolition of open-road racing, i.e., such point-to-point events as the Mille Miglia, the Carrera Pan Americana and the Targa Florio which are run on open, virtually uncontrolled roads. We are inclined to agree that such racing has no place in the world today. While it is true that no one forces people to line these courses like human fences (in fact it is impossible to keep them away), it is equally true that people should be protected from the consequences of their own rash deeds insofar as it is possible.

Unfortunately the article did not stop with a rational case against open-road events but went on to indict motor racing as a whole, unjustifiably and worse, irresponsibly. The poorly prepared text was only one of the several irresponsibilities.

A plea for the abolition of open-road events is entirely irrelevant in an American publication for the simple reason that there hasn't been such a race in this country since the days of the Vanderbilt Cup and the Elgin Road Race. Yet this wasn't the final irresponsibility but merely an indictment of the judgement of the editors of the magazine.

More damning was the ghastly way in which this particular dead horse was beaten. Dredged up were the pictures of Le Mans 1955, pictures that none but the most sensational dailies used at the time that particular disaster was horrifyingly fresh. Not only was the dead horse beaten; it was flogged with a barbed knout.

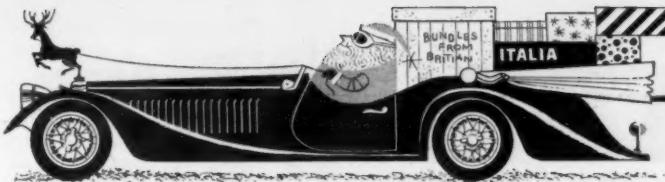
Cynically forgotten was the fact that we in the United States on an ordinary week-end bathe more roadways with more blood than motor racing has in twenty years. Europe is even worse, a fact also ignored. But even this was not the final irresponsibility committed by authors and editors alike.

The crowning irresponsible act was the use of that particular title, words that carried the implication that Taruffi and indeed all racing and sports car drivers are addicted, sick murderers who must plead with others to stop them from slaughter because they cannot stop themselves.

To know the case histories of psychotic killers such as the young man mentioned earlier is to know the depths to which the human mind can plummet. Thus to accuse, even by implication, a group of sportsmen either professional or amateur of like behavior is mass character assassination of a peculiarly twisted sort as demeaning to the publisher thereof as to the victims.

The least that can be expected is a public apology to the men of the sport of men.

—john christy



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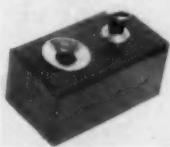
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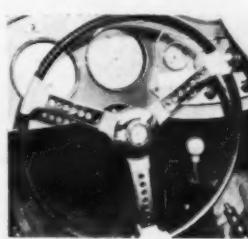


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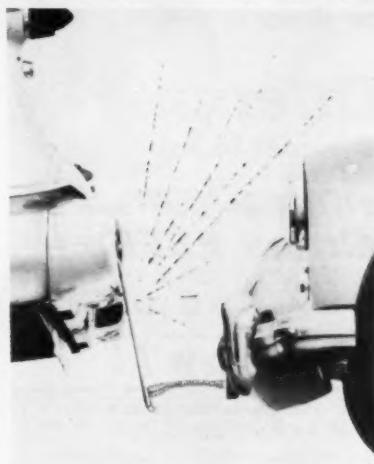
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letters

PRO-AM

Admittedly there are two sides to every question but I know of no sport which has quite successfully blended the oil and water dissimilarities of professional and amateur. I further do not feel that this will be an exception to that rule. I would further note that the larger percentage of your panel have quite a deal to gain by such a proposed venture in that they derive the major part of their daily living from racing or from cars or from the automotive field. Rather than rescue these chestnuts from the fire suppose you now concentrate on a poll from the pure amateur, and I do not mean the pro-amateur who is being financed.

Pressure is not mounting against Simon pure amateurism save from a very few interested parties who are in the main either promoters or the pro-amateurs. If these so desire to have racing sports cars on a professional basis I would advise they lend their time, efforts and ballyhoo to RRR or the Grand Prix Register. SCCA was never intended for anything but amateur racing and I sincerely hope will not only remain dedicated to these principles but will reaffirm them. I see no need of drawing their name into this at all. SCCA has never denied that any member race for money. It has merely said that when you do cast your die and cross the Rubicon to remain there. I cannot understand this feeling of ambivalence where these proponents would like to straddle the fence and mix the pro and the amateur. You are one or the other. You cannot be both. With their pro racing I wish them the best of luck. Pro football has proved very lucrative but college games still draw an awfully good gate. After one leaves college then he can play pro . . . but he can't come back. So be it . . .

P. T. Merriman
Atlanta, Ga.

loss — one T-bird

I have purchased your periodical almost from its inception; not because of any admiration of its format or contents; but because material in this field is so limited in this country.

Under the original management your magazine was a slavish imitation of "the motor enthusiast's magazine" interspersed with items plagiarized from British sources. Since the acquisition of your publication by the Ziff-Davis Publishing House, the quality has improved considerably, but the subject matter has changed vastly.

There is one fine feature in the new Sports Cars Illustrated, namely the fine technical reviews and cutaways by your Technical Editor. The rest of the magazine is far below par.

The main body of your periodical consists of six or seven articles which fall into the following categories: the ruining of fine, dependable, economy sedans by "hopping up"; the desecration of excellent sporting machinery by the same horrible process; the description of back yard monstrosities assembled by refugees from erector sets; and those articles by Dennis May

which repeat facts well known to all motor enthusiasts.

You try to justify the publication of this tripe by claiming the largest circulation of any sports car magazine. This is faulty reasoning on two counts. First, you no longer publish a sports car magazine. Second, quantity is no substitute for quality! Far more Thunderbirds are sold than Ferraris.

Robert N. Dusek
B. Bruce-Briggs

Manhasset, New York

That question, "what is a sports car?" has occasioned more fist fights than any ten elections. A certain segment of anti-nationalists to the contrary, just any underpowered roadster with wire wheels and an import tax is not necessarily a sports car. The reverse is also true. Put it this way: A sports car is a car that can be and is driven like a sports car.—Ed.

collegiate drags

Within the past year student enthusiasts here at Kent State have formed and incorporated a sports car club.

I would be interested in hearing from other collegiate sports car clubs in order that we might discuss our mutual interests and problems. Perhaps some plans might be laid for invitational events on the college level and a general integration of information and activities.

Ed Gillies
Kent State University
Kent, Ohio

III = I + II

Good luck to George Bevis in his attempt to organize Formula I and Formula II racing in the U. S. After seeing the turnout of Formula III machines at the courses in this area I am convinced that it was never organized properly in the first place, and that Formula II might be just the answer. The boys that drive in the Formula III events surely get a thrill out of it though.

W. E. Kuhn, III
Albany, New York

me bring beads

Your article, "Confessions of an Egg Owner" was very heartening, indeed. As a philosopher-sociologist, I am more than mildly concerned over the "cult of conformity" in modern America — a trend epitomized by the grey flannel suit and the "Face in the Crowd."

I myself have had a series of small and off-the-beaten-trail cars, and have enjoyed them all immensely. And yes, these little economy cars are sports cars, too. Beside the sport of driving itself, the fun of being different, there is the "social" sport of countering nasty cracks with quick repartee, and the deep-down satisfaction of knowing that your own quick remark has beaten "them" to the punch and left them helpless, or better—toothless. Remember, too, critics are potentially converts, and sincere questions should be answered with friendliness and enthusiasm.

The other day, a student pulled up in front of the Science building in a Messerschmitt, stepped out, and brandishing a plastic disintegrator-ray gun, cried, "Take me to your leader!" The opposition "disintegrated" amid howls of laughter.

Roy W. West
Lansdowne, Penna.



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TECHNOTES

MALLORY FOR XK140MC

Can you supply me with the Mallory distributor number for my Jaguar? I drive a 1956 XK140MC with 9/1 pistons, and the Lucas service number for the present distributor is 40445A.

C. M. Cash

Indianapolis, Indiana

The Mallory index, Form 415, lists three Lucas part numbers for the XK140 Jag. These are: 40276A, 40436, and 40199E. None of these match your distributor number, so it's hard to make a recommendation, but it seems likely that the right one is Mallory No. YC-278C. This is supplied for the bulk of the Jaguars listed. Its retail price is \$54.

As a matter of interest, Mallory also lists distributors for Aston-Martin, Austin, Healey, Fiat, Lea-Francis, Mercedes, MG, Porsche, Triumph, Rolls, VW and English Ford. For further information write Mallory Electric Corp., 109 West 64th Street, New York, attention Mr. Davidson.

REGEARING THE MGA

I would like to install an overdrive in my MGA. What do you think of this?

E. G. Fawcett
Craig AFB, Alabama

Installing an overdrive in an MGA or a Magnette is a tedious and expensive proposition and from a purely dollars and sense point of view, there is little to recommend it, as the inconvenience in a now-crowded cockpit would outweigh the advantages.

If you wish the engine to turn a bit slower while cruising cross-country, a ring and pinion set of numerically lower ratio could be installed at much less expense and inconvenience. The drawback is that acceleration in all gears is reduced, requiring greater use of them around town. If you install an OD without simultaneously raising the rear axle ratio, your MGA will be one dead duck in QD 4th, which is why manufacturers usually do just that on OD equipped cars.

The picture is brighter for those who want more acceleration and less economy as the following ring and pinion sets are available through BMC dealers for the "B" type axle: 5.12/1, 4.88/1, 4.55/1, and 4.30/1. The MGAs usually are made with the 4.30/1 but yours might be equipped with the optional 4.55/1.

Larger rear tires would also help you, but watch out for fender clearance.

ENGINE MOUNTS

I would like to know if there is an outfit that makes special rubber engine mounts. I have an Austin A-50 and feel that the mounts are too rigid and do not give any free play to the motor.

Naturally, if I am wrong about this I would like to know about it, but there must be some way to keep engine vibration from making a sounding board of unit constructed light cars.

Robert J. Artrip
Norfolk, Va.

Engine mounting is such a complex business that even if a special mount maker were available, he wouldn't know just what type of change to make in your system. The mounts may actually need to be stiffer than they are now.

Your best bet would be to soundproof your Austin as much as possible, using undercoating and the silencing method described in our former journal Auto Mechanics. The issues are August, September and October 1956, and are available at 35¢ each from our Chicago office.

TC STEERING

I just traded my '53 TD for a '48 TC and, of course, I miss the rack and pinion steering. I don't expect to have the equal in my TC but I'd like to know some of the improvements, adjustments, or modifications in the steering that other TC owners have found helpful.

Donald R. Borthwick
Detroit, Michigan

There was a device called the Tompkins Roller Steering Kit over the TC that retailed for about \$30. It consisted of a new aluminum cover plate with a depression in it to hold a tapered roller bearing, which took the thrust of the steering arm that previously was held simply by the inside of the box cover. This was sold by Sports Cars Ltd., in California, of which nothing has been heard recently. You might check with some old-time dealers and see if they can locate this device.

The Tompkins deal is good but it's not worth installing unless the rest of the box is in good shape. It should be taken down and the worm and peg inspected for excessive wear. When done, with all clearances just right and brand new kingpins and bushings (check your king-pin inclination, too), plus the Tompkins cover and grease in the right places, you'll think you're back in your TD again — until you feel the first bump.



CORRECTION

AUTOBOOKS has never had any VW Factory Workshop Manuals but we do now have a VW Service Manual printed in Australia by a private publisher with the full approval of and in association with VW-Australia for dealers down under.

The Manual is as complete as the Factory Manual and has the advantage of not referring to a specific (and unobtainable) VW tool for every operation. Many mechanics already fortunate enough to own a Factory Shop Manual consider this Australian Manual superior in this respect alone. Everything is thoroughly covered including the frame and body.

Harry Morrow—Autobooks
Burbank, California

CONSISTENT CHAMP COMMENTS

I was glad to see that Al Fonda was interested enough in "Consistent Champion" (SCI, Oct. '57) to comment so accurately and extensively in the December Tech Notes, but I'm sorry that the inspiration had to be based on a downright blunder. The phrase in question should have read "... the less roll stiffness, the lower the overall weight transfer, and the better the car's sheer traction."

This of course will check out much better with later remarks on the Lancia D50 as well as with other SCI Tech Report evaluations. There was not always the reason or the room to go into the Reasons Why as thoroughly as Mr. Fonda did, however. The distinction that he makes between *weight* and *load* transfer is valid and useful and is a worthwhile step toward a definitive vocabulary of handling terms.

On the original D50 though, I don't believe the car's response to power was as consistent as he suggested. The behavior he describes sounds more like that of the Ferrari-modified version, the type which Fangio was herding around Silverstone in '56 in such a wide variety of car and front wheel positions.

Observed handling of these 1956 Ferrari-Lancias suggested that Enzo had gone too far with his changes, and more recently his designers have been edging back to Jano's evenly balanced ideal. A contemporary who tried the same approach far more obviously was Colombo on his solid-axled Type 251 Bugatti, which seemed to be similarly indecisive as to which end to aim at the haybales.

In any case, designers now have a pretty good idea of how and why racing cars handle the way they do, and can "design in" desirable qualities, but they haven't yet agreed on the purpose of one critical component: the driver. Is the human a flaw that prevents the attainment of perfect cornering, or will his artistry always make a chassis perform one miraculous stage beyond the theoretical ideal? I think the latter is true; how do the readers feel about it?

Karl Ludvigsen
Ft. Monmouth, N. J.

Our proofreader's face has turned Italian Racing Red; if he makes another mistake like that, we're going to ship him off to Modena. The really significant thing about roll stiffness is its front to rear ratio. Along with the c.g. height above roll axis, the total roll stiffness does determine the amplitude or amount of roll, but this does not affect traction except, as Mr. Fonda noted, through the small amount of weight transfer. It does, of course, have a definite effect on steering geometry and passenger morale.

AUSTIN-HEALEY 100-6 MM KIT

As an enthusiastic subscriber to Sports Cars Illustrated and service executive of the Hambro Automotive Corporation, I was pleasantly surprised to read about the modifications intended for the 1958 Austin-Healeys.

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G. O. Ehrman
Cos Cob, Conn.

DISC BRAKE DIFFICULTIES

On my Lotus Eleven, I get all the symptoms of air in the brake lines although I have bled all the lines and kept the brake fluid reservoir full. When I leave the pits for a practice lap, as soon as I get to racing speed, I immediately lose about three-fourths of my pedal travel. It will pump up right away and if I stop the car, it stays up, but as soon as I get back on the course, I've got all that sponginess again. The brakes are Girling disc brakes which are self-adjusting for clearance between the disc and the pads. I have also checked the free pedal which is OK.

I have a friend who has a D-type Jag with all the same symptoms and we have just about given up.

Ted Cannon
North Hollywood, Calif.

Check your front wheel bearings for looseness. If they are not properly adjusted, this will enable the hub assembly to vibrate; as the disc is rigidly attached to the hub, it will vibrate, too, but at a much larger amplitude due to its large diameter. To the pads, the disc appears to be much "thicker" than it is, pressing the pads back. Then, when the brakes are applied, an extra large quantity of fluid is required from the master cylinder to move the pads through an extra large distance, giving you the feeling of a soft pedal.

1172cc HOP-UPS

In the road test on the Morgan 4/4 Series II (SCI Nov., '57), you state that the cost of flat head speed equipment for the Ford 100E engine is \$275 on the West Coast. Who sells it and where? I have an Anglia which uses the same engine and would like to make it go faster.

Ralph H. Grove
Indianapolis, Indiana

We don't know who sells the flat-head goodies for the Ford 1172 cc engine, but for only \$40 more, you can put a Willment overhead intake valve conversion that incorporates a dual manifold. American distributors for Willment are Genuine Foreign Parts, 811 Scarsdale Ave., Scarsdale, N. Y.

The kit retails for \$295 less carbs. You can leave the stock cam and exhaust manifold on. (I'd recommend the former because with the 2.01 second gear, you need a wide torque range.) To save money, you can duplicate the 26mm Solex on the dual manifold, but for really winding it up, two 32 PBICs are just the thing.

A good testimonial to the worth of this kit is that the Autosport Production Sports Car Championship for 1957 was won with a Willment-equipped Lotus Eleven Sports. Of course, the Limey's idea of what makes a production sports car is more than a little bit different from the SCCA's, but its competition was equally "production."

"BOLTING ON" A FOURTH SPEED

A statement in the Morgan 4/4 Road Test (SCI Nov. '57) compels me to put down a few facts as my brother and I found them. In 1955 I bought a Ford Prefect which I thought good in most respects except for the huge gap between second and third gears. Several people "in the know" said that installing the gearbox from a side-valve Morris Minor was just a case of bolting it on. Here is what we had to do:

The primary shafts are completely different. We cut off the splined end of the Prefect's to use with the gear end of the Minor's. We bored one and turned the other to a tight fit—then grooved and welded the joint. (Check carefully for eccentricity here.) We ground with a portable grinder the inside of the Minor transmission housing to give clearance to the Ford clutch. We cut the Prefect throw-out bearing sleeve off its plate and brazed it to the Minor plate. This enabled us to use the hydraulic clutch mechanism in the Ford.

We located and installed new dowel pins and cap screws. We fabricated a new rear mount for the Minor box to match the 3 point mounting system (typically Ford) used in the Prefect. We cut off and shortened the driveshaft 1½ inches. It has, fortunately, universal joints identical to the Prefect's. The floorboards needed a little altering, but not much.

We have also done some work on the engine, porting and relieving drastically and milling 0.050 in off the head. We took the fan off over a year ago, but we haven't had a sign of overheating. We are in the process of making tuned headers and a new intake manifold which will handle a Ford V-8 60 carburetor—one throat for each pair of cylinders, with a balance tube between.

The car performs very well now. Third gear easily brings up 60 mph, and the ratios are very close. But we don't want anyone to get the idea that it was simply a matter of "bolting it on."

W. J. Cope
Brighton, Ontario

Thanks very much for the inside word on this very desirable conversion. We agree, you don't just bolt it on. Has anyone tried the 4-speed box from the Standard 8 or 10? It too has very close ratios and might be easier to install behind the Ford engine than the Minor's.

Your engine changes sound very good. We hope that your new manifold will connect cylinders 1 and 4 to one throat and 2 and 3 to the other, using port dividers in the siamezed intake ports. This will even out the pulses in the carb throats. But even with a regular twin carb set-up, the extra breathing capacity should be a big improvement.

For the technically minded, the gear ratios in the Ford are 3.89, 2.01, and 1.00; while in the side valve Minor they are 3.95, 2.30, 1.54, and 1.00. The new Minor 1000 has 3.63, 2.37, 1.41, and 1.00. The early ohv Minor's gearbox, may it rest in pieces, had 4.09, 2.59, 1.68, and 1.00, which makes its installation hardly worth while.

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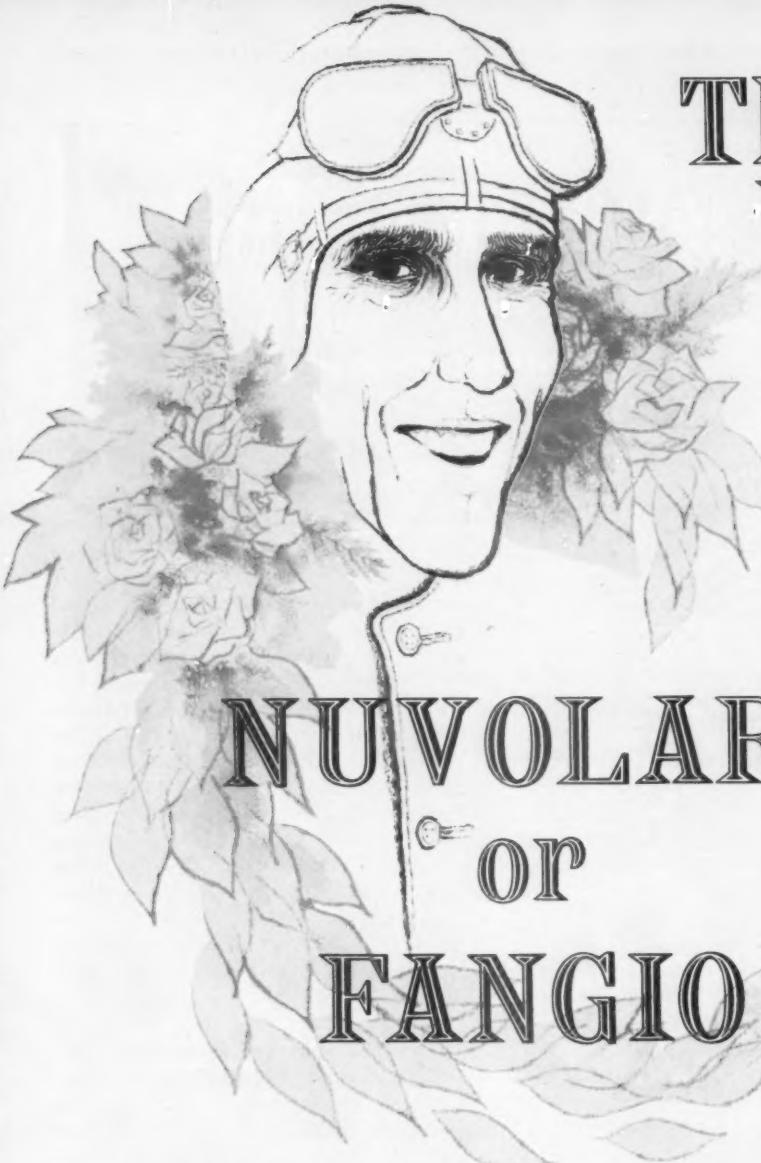
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The World's Finest:

NUVOLARI or FANGIO



The question is now raised: has Italy's ace been trumped?

by Ken W. Purdy

WHEN Juan Manuel Fangio won the 19th Grand Prix of Germany at the Nürburgring last August, breaking the lap record *ten times* to come home 3.6 seconds ahead of Mike Hawthorn after 312 miles of racing, most of the experts present slumped back into their seats and told themselves that they had seen the Old Man in the best performance of his life, and one of the best performances of all time. The correspondent of *The Motor* went all the way. He said that Fangio's had been "the most breathtaking exhibition of driving since Nuvolari."

It had to come eventually; a citation of the fabulous Argentinian as the peer of the Italian who has until now been universally regarded as the greatest automobile driver who ever held a wheel in his hands. (The more chauvinistic Italians are quick to argue that Fangio really belongs to them: he is only a first-generation Argentinian and his parents were born in Italy.) If, as is likely, Fangio retires this year, perhaps the question can be settled, or as nearly settled as such comparisons ever are.

If the 1957 Grand Prix of Germany was in fact Fangio's greatest race the comparison benefits because one of Nuvolari's major triumphs was on the Nürburgring, two decades ago, in 1935. Unlike Fangio, Nuvolari came to the Ring that year an underdog.

On form, Fangio figured to win the Nürburgring this

year. He had won it three times in the past, and three times in succession at that. He held the lap record for the 17.6-mile course of steep grades and mean curves at 9 minutes 41.6 seconds, 87.74 miles per hour, and he broke it on the first day of practice at 9 minutes 25.6 seconds, an average of 90.29 miles per hour. Before the race was over he had broken it eight times more, pounding it down to 9.17.4 or almost 92 miles an hour. He started on the pole, carrying a half-tank of fuel, and ran behind Hawthorn and Collins until the third lap, when he took over. He led until the 12th lap, when he stopped to pick up two new rear tires and another half-tank of fuel. (Hawthorn and Collins had started with full tanks, did not have to re-fuel.) The pit stop cost him 56 seconds and put him 33 seconds behind the leader, Hawthorn, on the 18th lap. He spent one lap apparently trying to lull the two Ferrari drivers into a false security, dropping three seconds further behind to do it. Then he opened the tap and began closing on them: 32 seconds, 25, 20, 13, 3 seconds. Hawthorn was still leading, Collins second. On the last lap Fangio passed Collins, was re-passed, took him again, caught Hawthorn and won going away to post an average speed of 88.79, faster than his 1956 record lap. Fangio's performance was astounding for sheer speed and virtuosity, and memorable, too, for coolness and strategy (the sacrifice of a pit-stop for the early



Photos: World Wide

Fangio and his winning Maserati in the 1957 Grosser Preis v Deutschland, the race described as his best performance and "the most breathtaking exhibition of driving since Nuvolari. He lulled the two leading Ferrari drivers into false security—then turned on the tap."

lightness of a half-load of fuel, the craft that half-convinced the Ferrari team, for a precious few minutes, that his Lap 12 stop had ended his chance of winning.) It was a perfect race, and Fangio ran it as he always does: cold, unruffled, thinking miles and minutes ahead, surprised never. Those who have called it his greatest race were probably right.

When Tazio Nuvolari came to the Nürburgring in 1935 for what was to be his greatest race, the role laid out for him was strictly that of spear-carrier. Nobody conceded him a chance. In the first place, his right leg and foot were in plaster of paris, and no one believed that even Nuvolari could drive, much less win on one of the toughest brake-and-accelerate courses ever laid out with a lump of stone on his business foot. (With the *brio* that was characteristic of him, and that contrasts so strongly with Fangio's modesty, Nuvolari told a friend that he couldn't care less, he intended just to lay the thing on the go-pedal and leave it there.)

Secondly, Nuvolari was mounted on an ancient car that was demonstrably slower than the machinery being used by the favorites: two full teams of Auto-Unions and Mercedes-Benz man-eaters, nine of them in all. He was driving a P-3 Alfa that was, compared with the German single-seaters

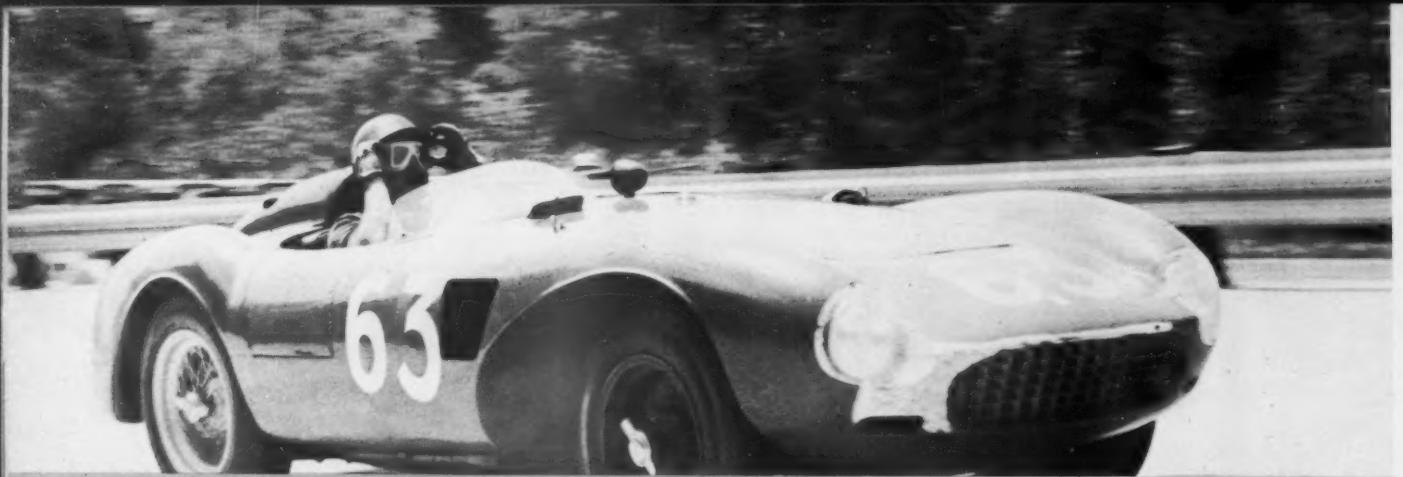
of the time, a technological orphan. The P-3 in its original form was a 2.6-liter straight-eight carrying two blowers, and in 1932 and 1933 it had been a world-beater. It had 190 horsepower and could do 140 miles an hour. It was very light, due in part to the famous double drive-shaft which split the power at the gear-box and took it to bevel gears at each rear wheel. The car Nuvolari drove at the Nürburgring had a 3.8-liter engine and at 305 horsepower was giving away 125 to the 25W Mercedes-Benz, at 430, and 70 bhp to the Auto-Unions. It was generally agreed among experts on the ground that Nuvolari's P-3 was about 15 miles an hour slower than the 175 mph 25W Mercedes and 20 miles under the B-type Auto-Union, which would do 180.

When the flag fell the torque of the 4-liter and 4.5-liter Germans told and Nuvolari was nowhere. He was 6th going into the sixth lap and everyone expected him to run there, lending a little color to the proceedings, and finish out of the money. But in the 7th lap the little 43-year-old Italian began to demonstrate that he had been conning the opposition. He pulled the handle and blew off a couple of cars and then took the great Bernd Rosemeyer, destined to be the best of the Auto-Union pilots. He set out after the next

With a lump of plaster on his business foot and herding a car 15 mph slower than his competition, Il Maestro also made the 1935 'Ring race his greatest. Copping lead in an impossible early sprint, he was set back to fifth by a slow pit stop. Charging out, he moved up to second, forced the leading Brauchitsch to blow a tire on the last lap, and won.

Illustration by Carlo Demand
from The Big Race





Fangio's driving style is logical and intelligent with no dramatics, although even he can occasionally be caught (as here) adjusting his goggles while at speed. But generally, after the initial rush into the first turn, he is seldom seen in a wheel-to-wheel dust-up. On course he is courteous, almost courtly; he knows who his friends are and lets them know he knows.

in line, Louis Chiron, lying 3rd, and by the 10th lap he had taken Chiron and Brauchitsch and was the biggest thing in Caracciola's rear-view mirrors. He took Caracciola in the tenth lap and was leading the race when he went in for fuel. He expected to hold the lead, since everybody else had to re-fuel, too, but while the Germans did it in as little as 47 seconds, Nuvolari's pit took 2 minutes 14 seconds. (A mighty-muscled Alfa mechanic, in ecstasy over "Nuvola's" performance, twisted the handle off the pump, and the rest had to be done with cans, while Nuvolari, never a model of calm, screamed and rent his garments.)

He came out of the pit lying fifth, faced with the tiresome necessity of beating the Germans all over again. There was no reason to suppose that he could do it. Their cars were faster, and they knew now what they were dealing with. But Nuvolari, on his good days, could always make a car go faster than it could go, and he took Caracciola, Rosemeyer and Faglioli again, and he did it in one lap. Brauchitsch was leading, and the good gray Neubauer was on the edge of the track holding up GO signs, whiskey-bottles and according to some possibly biased observers, a medium-caliber sporting rifle significant of the fate that awaited the red-headed Mercedes pilot if he didn't get his foot well and truly into it. Brauchitsch, not always a model of obedience, did as he was told and broke the lap record. But he couldn't keep it up, and Nuvolari began to make a steady 16 seconds a lap on him. Brauchitsch's tires were wearing visibly as a result of the flogging he was giving them,

and he knew that to get home in one piece he ought to stroke it a little. Neither Neubauer, red-eyed with fury, nor Nuvolari, taking every corner in an impossible drift, would cooperate, however, and so he kept on spinning them until, in the last lap, one let go and Nuvolari blasted past him to win. Expert consensus was that he had beaten Brauchitsch twice: given a normal refuelling stop he'd have beaten him without the blown tire, and as it was he beat him by forcing him to over-extend his car. The question that can never be answered, though, is this: How did he get the old P-3 within striking distance of any of the nine German cars, even once?

Since it has to be conceded that the 250F Maserati Fangio used at the Nürburgring was at least as good a machine as the Ferraris he beat with it, it doesn't seem to me that he proved himself a greater driver than Nuvolari last August. Nuvolari's fastest lap speed in 1935 was 79.3 and Fangio's, on a surface probably about as good—it was new when Nuvolari ran on it and it has been partially resurfaced since—was 91.4. The 12.1 difference is logical in the light of 22 years of technological evolution.

Since there were only national championships to be won in Nuvolari's time, no world title, it is impossible to place him against Fangio's five world championships. And since the major races are not the same today as they were 20 years ago, a hypothetical standard cannot be established. In 1935, when Nuvolari was at the top of his form, counting Grand Prix races alone, he had six first places, a second and a third, which would give him, by today's

(Continued on page 50)

Fangio has his sombre moments, too. Off the course he is quiet and unassuming; on the course he is considerate of other drivers, but has an ability to pick out the highest speed at which he can negotiate the course. Never the extrovert, he seems to have every muscle relaxed; yet after a few laps he knows every turn and every stone on the track.





Fangio is the same well-integrated personality whether he wins or loses; but the grin may be a bit bigger in cases of the former. He doesn't consider a win a personal thing, and wants to share the honors with the other drivers.



Illustrations: Don Cornelius

He shouted, smiled or glared at the other drivers; but he could always make a car go faster than it was supposed to go. When he won, which he did 64 times, he'd break into a big grin, as he and co-driver Sommer did at Le Mans in 1933.

World Wide



Back in 1936, Nuvolari dropped in on Roosevelt Raceway to pick up a little silverware with his Alfa Romeo.



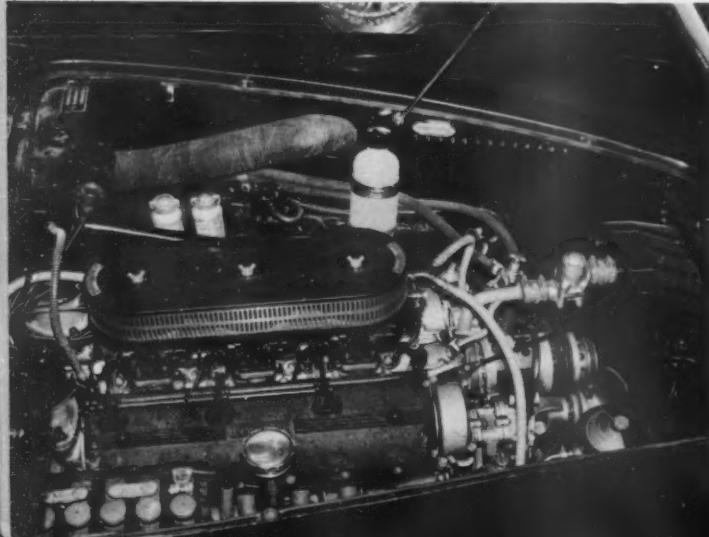
ROAD TEST:

Ferrari 250 GT Europa

Engine heat and noise have been completely insulated out of the passenger compartment. The seat is on the same level as the covered tunnel, making room for an occasional passenger.



Under the hood is the standard ohc Ferrari V-12, except that distributors are mounted at the rear. Everything but the generator is chain-driven; yet the engine is very quiet. The lines that look like BX cable are armored flex sections.



A REAL milestone in Ferrari history was the introduction in 1956 of the 250 Gran Turismo line. The importance of the event derived from two facts: it marked the emergence of the small Italian firm as a series-production manufacturer *and* as a builder of spirited but astonishingly docile road machinery. It was a logical and long-hoped-for breakthrough, and as the new 250 GTs become more widely known they are bound to achieve the degree of stature that has been earned by the magnificent racing Ferraris. The 250 GT is a masterpiece. Hardly any other cars in the world compare with it—except other Ferraris.

To appreciate the 250 GT fully you have to weigh it against the firm's earlier efforts at building touring machines. Previous Ferrari practice consisted of simply dropping a road-type body on a competition chassis. This made a wonderful car—if your taste ran to the stark and spartan. Noise and heat from the engine were oppressive if not overwhelming. The unforgiving spur-cut gearbox demanded unusual driving skill. Interior appointments usually were rudimentary. And so on.

The 250 GT, though, is no race car with touring coachwork. It is a designed-from-scratch high performance tourer that combines Ferrari's best competition chassis features with innumerable refinements that successfully tame the basic inner beast. It's a car that very feminine females have no difficulty handling. At the same time its recent victorious performances at Nürburgring and in the Tour de France suggest that it is today's fastest and most race-worthy production contender. On top of this, the new Ferrari is a luxury automobile in the grand manner. The design, detailing and execution of every part of its chassis and body reflect the builder's determination to put together a perfect machine. Finally, with a U.S. port of entry delivered price of \$10,975 (for the Farina-bodied coupe we tested), the 250 GT is not only the best "road" Ferrari produced to date but also the least expensive. And a roadster about to be introduced will be priced at below \$10,000.

One of the GTs we drove was brand new, but the one that got our all-out shakedown test was the '56 coupe that Richie Ginther drove to win this country's first *gran turismo* race at Lime Rock early last summer. Almost 12,000 miles showed on the car's odometer. It had been thrashed, bashed and loosened up to the point where large and small defects



should have started to show. But except for a hardness in the raced-on brake linings, there weren't any. In every respect the body and chassis were as tight and sound as new.

The door swings open at the press of a button. The body doorframes, front, bottom and rear are trimmed in hand-fitted aluminum polished to a mirror finish. The entire interior except for headliner and floor carpeting is done in soft leather color-keyed to the exterior finish. The two pleated and deep-bolstered seats are very wide and they're on the same level as the top of the padded transmission tunnel, so that an occasional passenger can be carried in decent comfort. Early 250 GT coupes (about 200 have been built to date) had pigmy-size rear seats, but these have now been replaced by a luggage shelf that can carry several large suitcases. The seating position in the 54-inch-high coupe is *à la* deckchair. The three-spoke wood-rimmed aluminum steering wheel is mounted so that in straight-ahead position the driver has a wholly unobstructed view of the road and of the three most important instruments: a five-inch-diameter speedometer and tachometer and, between them, an oil-pressure gauge. In typical Italian fashion (the Germans do it, too) the instrument panel, particularly its lower edge, is littered with toggle and pull switches, none of them labelled; this could stand correction. The only other point that could be criticized at all is the gearshift pattern. The car is so wide that the reach to a centrally-located shift lever would be excessive; therefore a transverse remote lever is used instead. Its linkage causes a reversal of the conventional four-speed H pattern:

R 3 1
4 2

The disadvantage here, of course, is that it's fairly easy to forget the proper motions, particularly if you drive another car that has the conventional pattern.

You engage the 250 GT's starter by turning the ignition key. If the car has been standing and fuel in the carb float bowls is low you can save unnecessary grinding and battery use by switching on the auxiliary electric fuel pump which complements the two mechanical pumps that take care of all normal operation. A manual choke is fitted and starting is an instantaneous process.

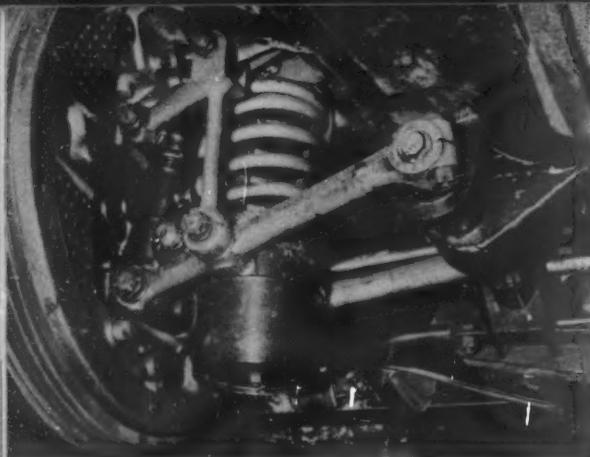
If you've driven Ferraris before you expect to hear the raucous, jangling whir of a pair of overhead camshafts clattering against 24 valves. But when the 250 comes to



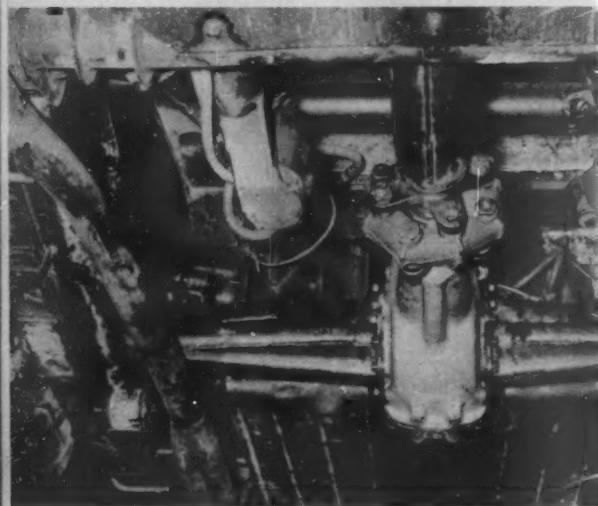
65 mph; fast, but not fast enough to make inside wheel lift sufficiently to break traction and spin. An extremely well mannered car, this Ferrari lets you know before you approach the limit, leaving time to correct.

View from the rear on the same corner shows the tires under heavy side loading, yet body is still nearly level. If the driver lets his enthusiasm exceed his judgement and the tail gets too far out, backing off on the power will bring it back.



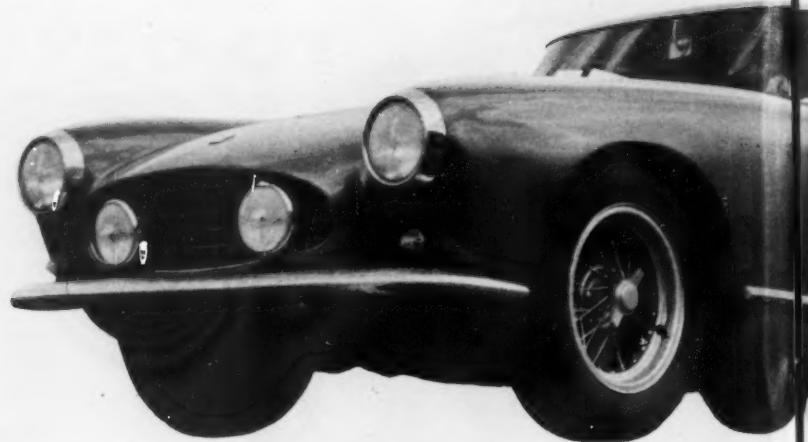


Unequal wishbones and coil springs held in steel "buckets" are similar to those on the latest LeMans 4.1 Ferrari. Buckets permit longer coil springs, giving softer ride.



With light alloy diff-case, sturdy Houdaille shocks and using four radius rods with fully-shackled semi-elliptic leaf springs, Ferrari follows old dictum, "If you can't go deDion or its, keep the back axle light and in its place."

The "Europa" is styled in contemporary Italian conservative theme. Strangely, the effect is almost Exner-like in certain aspects. Bumpers are curved and extended to protect the fenders and the chrome strip also serves as a rubbing bar.



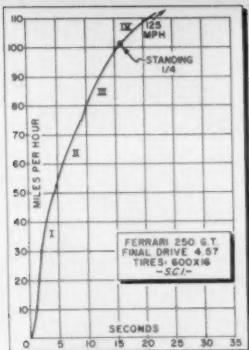
A clean, simple front, with a typically-Ferrari grille set into a slightly protruding snout, looks like it means business. Performance does not belie the looks.

life there's an instant when you wonder what's wrong. It's too quiet. Then you realize that the builder has succeeded in civilizing one of the world's most savage power plants. The valve gear is astonishingly silent. The loudest noise is the pleasant hum generated by the bevel-gear drives to the distributors, which in the 250 are mounted vertically at the rear of each cylinder bank. In addition to the silencing of the engine itself, the engine compartment is elaborately soundproofed.

With the engine ticking over at a normal idle of 600 rpm you depress the light clutch pedal and poke the stubby shift lever into first position. You discover, probably with pleasure, that the crash box of the past has been replaced by the Porsche-patent full-synchro transmission. The clutch takes hold as softly and gently as any good Detroit type.

This engine has, as Ginther puts it, "a phenomenal con-





FERRARI model 250 Gran Turismo

PERFORMANCE

TOP SPEED:

Two-way average 125.6 mph
Fastest one-way run 127.2 mph

ACCELERATION:

From zero to	
30 mph	2.0 sec.
40 mph	3.1 sec.
50 mph	4.3 sec.
60 mph	5.9 sec.
70 mph	7.9 sec.
80 mph	10.1 sec.
90 mph	12.4 sec.
100 mph	15.5 sec.
Standing $\frac{1}{4}$ mile	16.1 sec.
Speed at end of quarter	102 mph

SPEEDS AT 7000 RPM

Final drive	I	II	III	IV
4.57	54	76	102	126
4.25	58	82	110	135
4.00	61	85	115	144
3.77	65	92	124	153
3.66	67	95	128	157

SPEEDOMETER CORRECTION:

Indicated	Actual
30	28
40	37
50	46
60	55
70	64
80	74
90	83
100	92

FUEL CONSUMPTION:

Hard driving 9.4 mpg on test
Average driving 13.2 mpg under 60 mph

BRAKING EFFICIENCY:

10 successive emergency stops from 60 mph, just short of locking wheels
Fade nil; pulling to side nil; brake lining odor very slight.

SPECIFICATIONS

POWER UNIT:

Type	60° V-12
Valve Arrangement	SOHC (one cam per bank)
Bore & Stroke (Engl. & Met.)	2.87 x 2.31 ins./73 x 58.8 mm
Stroke Bore Ratio	0.81 to one
Displacement (Engl. & Met.)	180.3 cu. ins./2953 cc
Compression Ratio	8.5 to one
Carburetion by	3 twin-throat Weber downdrafts, type 36DC13
Max. bhp @ rpm	240 @ 7000
Idle Speed	600 rpm

DRIVE TRAIN:

Transmission ratios	I 2.53
	II 1.70
	III 1.25
	IV 1.00
Final drive ratio (test car)	4.57
Other available final drive ratios	4.85, 4.25, 4.00, 3.77, 3.66
Axle torque taken by	Torque arms (4)

CHASSIS:

Wheelbase	102.0 ins.
Front Tread	53.2 ins.
Rear Tread	53.0 ins.
Suspension, front	Independent; unequal-length wishbones. Coil springs.
Suspension, rear	Live axle; semi-elliptic springs
Shock absorbers	Houdaille
Steering type	Worm and gear
Steering wheel turns L to R	2.75
Turning diameter	23 ft.
Brake type	2 leading-shoe front; one leading, one trailing rear
Brake lining area	324 sq. ins.
Tire size	6.00 x 16

GENERAL:

Length	175.5 ins.
Width	66 ins.
Height	54 ins.
Weight, test car	(full tank) 2880 lbs.
Weight distribution, F/R	48/52
Fuel capacity	31.7 U. S. gallons

RATING FACTORS:

Bhp per cu. in.	1.33
Bhp per sq. in. piston area	3.09
Pounds per bhp—test car	12.0
Piston speed @ 60 mph	1282 fpm
Piston speed @ max bhp	2695 fpm
Brake lining area per ton (test car)	225 sq. ins.
MPH per 1000 rpm (test car)	18

(Continued on page 53)

genial range." With the engine idling and with your foot off the throttle you can let the clutch out and after perhaps an instant's hesitation, the car will pull away in bottom gear. Or you can take first gear out to the neighborhood of the 7000 rpm red line and pop the clutch for a zero-to-50 mph time of 4.5 seconds.

The engine is cammed so that its thrust is strongest above 5000 rpm but—obviously—its torque is strong even at very low revs. The full-synchro gearbox is foolproof and the gear ratios are spaced excellently. With our test car's 4.57 final drive you zoom right out to 75 in second, 100 in third and to 125-plus in fourth. Four other axle ratios are available and a top speed of 157 mph is claimed for the car with the 3.666 rear end gears. As for the low-speed limits in the top three cogs, we didn't find them. The speedometer's low peg is at 10 mph and the 250 pulls smoothly at that speed even in top gear! The combination of this kind of low-speed pulling power with screaming, slam-in-the-back acceleration that hustles you from zero to 120 mph in 24 seconds is just one of the unusual virtues of this rather unique machine.

Another is its rock-like solidity. It doesn't feel like an assembly made up of X number of diverse parts. It feels like you're riding a steel ingot. The burly, big-diameter tubular frame seems to have no give in it at all. Never has there been a more "machined from the solid" feel. Steering is by worm and wheel, following good *grand prix* car practice. Naturally it is utterly positive, and this you expect. The surprising thing is that it's so light. The coil spring and wishbone independent front suspension is identical to that on the latest Le Mans type 4.1 Ferraris. The live rear axle with light alloy center section is similar to the Testa Rossa's, but the 250, like all bigger-displacement Ferraris, uses leaf springs rather than coils. The de Dion layout is evidently considered unnecessary for the 250: it doesn't transmit that much power to the driving wheels. Rear axle driving and braking torque reactions are controlled by four sturdy radius rods.

by Stephen Wilder - Jesse Alexander

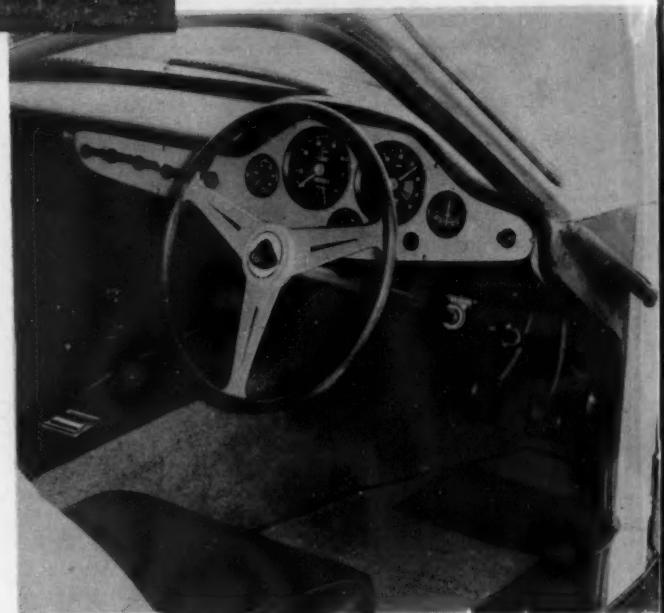
a new strain of LOTUS

In 1955 Colin Chapman surprised everyone by getting his Hornsey firm, Lotus Engineering, elected to the SMM&T just in time to exhibit a Lotus chassis at Earls Court. The following year he stole the show by putting a Formula 2 race car on the Lotus stand, a car that had not even been test-driven, as the engine had no crankshaft and was connected to a dummy transmission. This year Colin has completed a minor hat-trick. By using the annual event to present the Lotus Elite, a Gran Turismo coupe of exquisite lines, he has not only established himself as a leading designer (see SCI, June 1957) but as a master of publicity and showmanship second to none in his field. The Lotus stand was again inundated, while the fancy limousines and exotic Continental sports cars were virtually neglected.

Typically, Chapman put the Elite on display before it had been driven and production is at least six months off. The first dozen or so off the line will probably be full-race GT cars with goodies straight out of the F-2 machines. With them, the Team Lotus will attempt to win a race-proved reputation.

The production Elite will have a 1220 cc Coventry Climax engine using the 1100's crank with the 1500's pistons. With a single S.U., output is 78 hp. Both cars will feature rack and pinion steering and the light-weight unequal wishbone i.f.s. with built-in anti-roll bar of the F-2 race car.

The cutaway drawing shows Chapman's newest idea in rear suspension, a fully independent arrangement of charming simplicity. The nearly-vertical spring-shock struts establish the attitude of the rear wheels by being firmly anchored to the hub assemblies. A wide trailing arm (to fix toe-in) combines with the doubly U-jointed-but-unsplined axle shafts to establish the arc of motion. Eliminating the sliding



Instruments include 8000 rpm tach, 140 mph speedo (!), ammeter and gauges for water temp and oil pressure. Adjustable bucket seats are well separated by tunnel.

A carefully shaped shadow-box neatly concludes the tail of this handsome coupe. Above the rear window appears to be provision for air vents to help cool the interior.



splines on the axles is advantageous because the friction involved in them when accelerating or braking over a bump creates a noticeable but irregular amount of friction damping in the rear suspension. On a larger car it is feasible to use recirculating balls on the splines, but on a car like the Lotus, the increase in semi-sprung weight would more than offset the benefits. The rear wheel geometry is rather like a swing axle set-up, but has much less camber change with deflection, which should be very good indeed. It's also possible to have lots of negative camber all the time without the ground clearance problem of a low pivot-point arrangement.

For the first time, Chapman is using fiberglas, and as might be expected, there are some novel touches. For one thing, it's a monocoque body, and for another, a fair amount of steel is bonded in where high strength and low bulk are necessary. A major member under each door sill provides

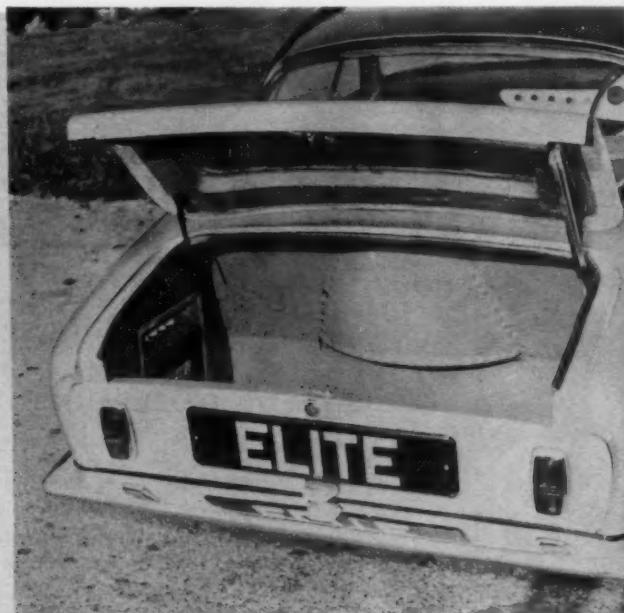
beam strength. A rearward slanting tubular hoop serves as both roll-over bar and windshield frame. Attached to this hoop are the door hinges and a cross strut which carries the steering column, the hand brake, and the instrument panel.

Ahead of this hoop and above the forward extension of the door sills is a shear panel in the best aircraft tradition, but made of fiberglas. The firewall and rear bulkhead are also stressed members of the same material. Steel cross members carry the engine mounts and front suspension. A long fiberglas box, thoroughly separating the two bucket seats and surrounding the transmission and driveshaft, terminates at the bulkheads, desirably increasing torsional rigidity across the cockpit space.

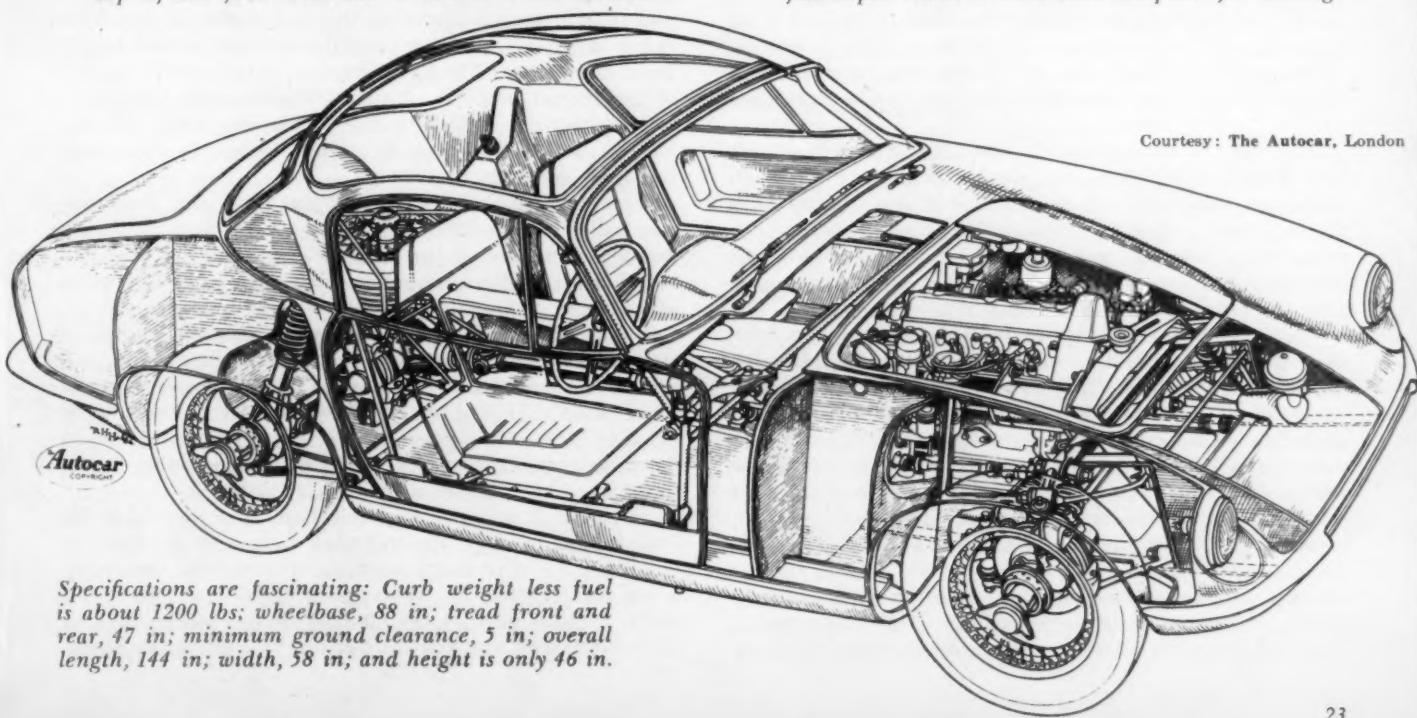
Price? A bit over \$4000 at ports of entry, says Jay Chamberlain, USA distributor for Lotus. Giuletta and Porsche drivers beware!



Rear parcel shelf is pretty well filled by the spare, even more so when optional second one is piled on top of the first. Tire size is 4.90 x 15 all around.

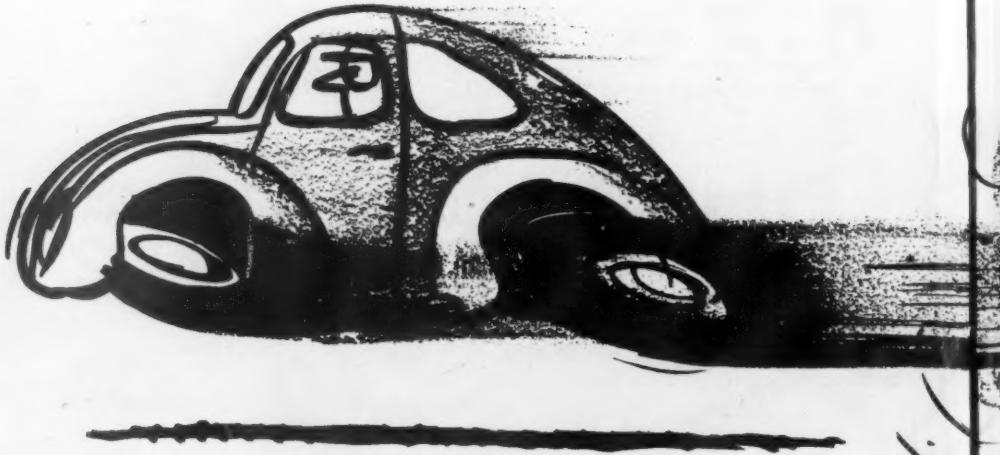


With the fuel tanks mounted in the front fenders and the 28 pound battery carefully tucked to one side, the full depth trunk is more than adequate for touring.



Courtesy: The Autocar, London

Specifications are fascinating: Curb weight less fuel is about 1200 lbs; wheelbase, 88 in; tread front and rear, 47 in; minimum ground clearance, 5 in; overall length, 144 in; width, 58 in; and height is only 46 in.



VIOLENT

by Bob Cumberford

HERE are many thousands of Volkswagen owners in the United States who are perfectly happy with their Teutonic economy cars. There are also many thousands who are not. Their complaint: the VW as delivered just doesn't have enough steam. Dozens of remedies for this condition have been tried, ranging from Lincoln pennies in the heat risers, through dual carburetors and blowers, to Porsche Super engines. All of them help, a little or a lot, but none will get you from stoplight to stoplight as quickly as the gray haired little old lady in the next lane can do it in her conservative pushbuttoned, fuel injected, air suspended "utility" car.

There is one VW owner who has found a way to get the job done. His VW is a real sleeper, and more fun than almost anything you can imagine. It will accelerate with the best of the machinery run on the streets without even being fully extended. His solution is an easy one, if you can stand the expense, and don't mind losing the use of your rear seat. Just install a Chevy V-8.

No, we're not being facetious. It has been done, and done successfully. The builder, who uses the car regularly for personal transportation, is well known as a sports-racing car owner. This fact helps to explain his somewhat unusual attitude toward the project. He is proud of the car, but does not wish to be identified in connection with it because he simply does not want to be bothered with showing it to interested enthusiasts. He hasn't time. The racing cars he owns are the direct cause for the creation of the violent VW. Being a man who enjoys a stoplight grand prix as well as the rest of us, he tried to use his hot machinery for ordinary driving. It wasn't too practical an idea. The police took a dim view of such cars, the financial risk in bumper bashing

traffic is considerable, and it's pretty hard to pick a drag when you're sitting amid a few sheets of artistically warped red aluminum. Especially when it houses an engine whose mechanical clatter is louder than its exhaust note. The black Chevy boys may take on a Jag or an SL, but they're too wise to tangle with a Maserati or Ferrari.

Clearly, something else was in order. For the first problem, police, it was apparent that a car that is noted for being slow, and one that is fairly common, would be the most appropriate. The VW seemed good here, and took care of the second problem, strength, automatically. Picking a drag wouldn't be difficult, either. The only problem left was making the VW go. You know the answer to that. Let's see how it was done.

From the outside, this fantastic machine looks absolutely standard, with two minor exceptions — a barely visible break line across the roof, in line with the door cuts, and Firestone Super Sports 170 racing tires, with snap-on white walls, of course.

Things don't look quite so normal when the "hood" is open, however. The entire body aft of the just mentioned line swings up from two rear pivot points, baring the complexities of the go works, as shown in the accompanying drawing. This means of engine access was determined to be the only remotely practical method, although the engine could have been installed through a door.

First step in making the conversion, after acquiring the VW, was to measure the available space very carefully to determine the most practical layout. Fortunately, the owner is not a large man, and it was possible to fix the seats in a rather forward position. By moving the rear wheels back in the wheelhouses one half inch, it was possible to use a con-

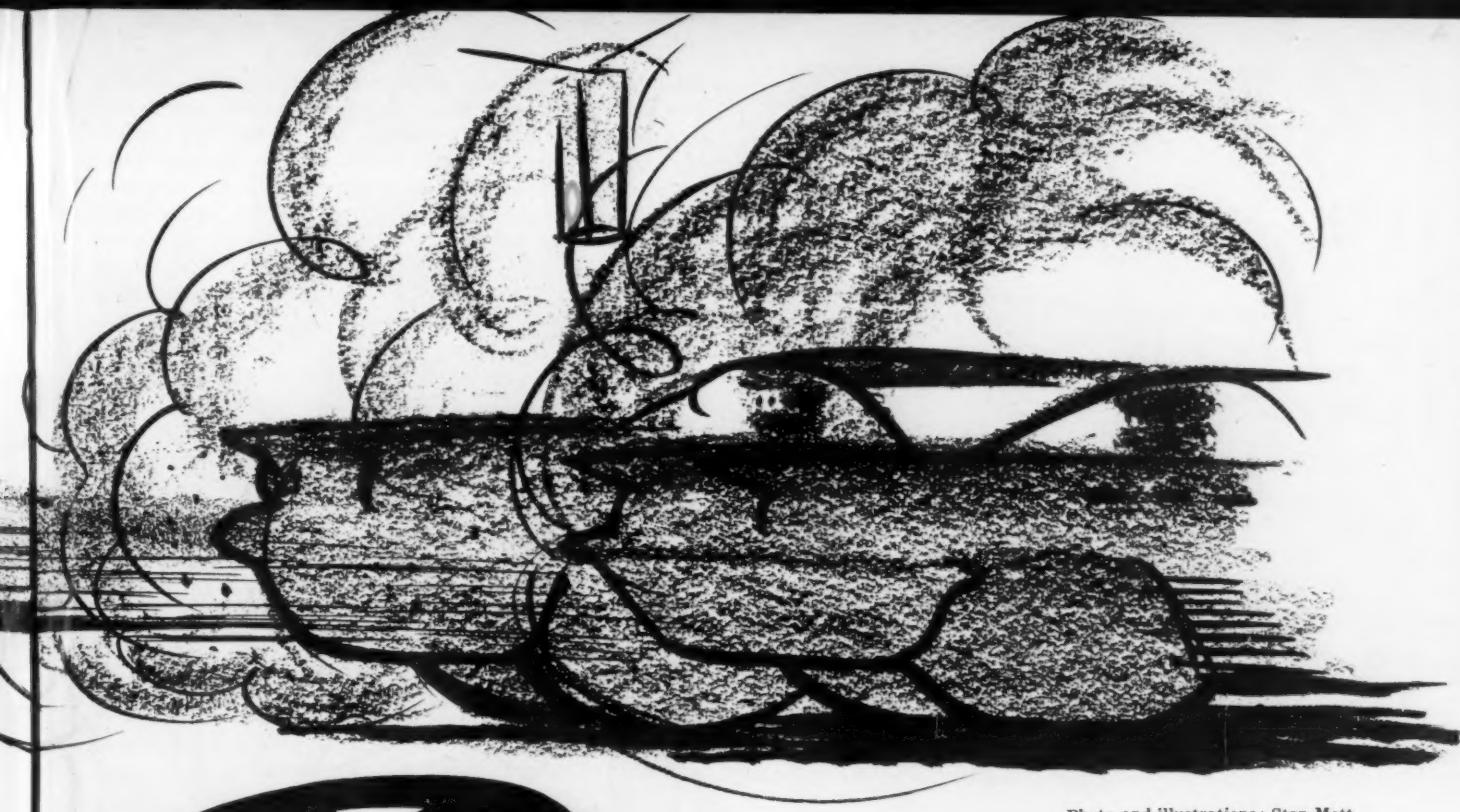


Photo and illustrations: Stan Mott



For the gent with dough and the yen to go—

ventional drive train arrangement of engine, clutch, gear box, universal joint, differential. This was thought to be much superior to the alternatives of using an expensive European unit with low torque capacity or a Cord F.W.D. assembly.

The interior trim was all removed, after which an air chisel was used to cut across the roof. This left the body in two pieces, the rear one of which was unbolted from the chassis and removed. After much discussion, it was decided to cut away the rear portions of the VW chassis platform as well, and make a new frame.

Using eighth-inch wall, 3 inch O.D. steel tubing, a simple ladder type frame was constructed. This was welded into the front floor, tunnel, and body sills. The sills, in which hot air is directed forward in the VW, were cut from the rear portion of the body and welded back onto the front section. This allowed the running boards to be secured to the main structure. In order to stiffen the chassis as much as possible, the firewall, constructed of channel-framed steel sheet, was permanently affixed by welding it to the floor and tunnel. For the same reason, the rear fender inner panels were cut from the body and welded to the chassis.

All this cutting tended to reduce the body tail section's torsional rigidity to slightly less than that of the Sunday paper, so the normal deck lid was welded shut, and small tubes were welded to the bottom edges. A brace runs across the body at a point just in front of the lower corners of the rear side windows. Two flathead Ford connecting rods welded to the rear chassis crossmember act as body support arms, with the body pivoting on them. Dzus fasteners, accessible from the front compartment, but invisible from outside, lock the rear body section down.

The engine is a normal 1957 Corvette fuel injection unit. Only non-standard parts are the neat hydraulic throttle actuating cylinder and specially fabricated headers. Clutch is a standard late '57 Corvette coil-spring type, hydraulically actuated from a standard Chevrolet master cylinder mounted next to the brake master cylinder.

The gear box is a Corvette 3-speed unit with the tail shaft housing removed. A new plate was machined from steel stock to retain the main shaft oil seal. The main shaft itself was cut and resplined to take the Ford u-joint. Differential housing, bolted to the chassis frame, is a Halibrand quick-change type, with Allard side plates.

Getting a shift linkage installed was no easy task. The Chevrolet side-shift levers were duplicated as idlers on the frame to the left of the box. From these, two rods run forward beside the engine to a "monkey motion" linkage under the driver's seat. This serves to unscramble the movements of the shift lever. Pattern is the same as a standard VW, with first gear gone.

The electrical system is 12 volt, with the battery in the front, behind the gas tank. One neat trick is in instrumentation. What looks like a standard 80 mph VW speedometer is actually an 8000 rpm Tachometer, a 12 volt electrical unit.

The front end has been much improved by fitting Porsche Spyder brakes, Porsche steering, with damper, and Porsche anti-roll stabilizer bar. Whether these changes effect a major improvement in handling is a moot point; the car has never been driven without them. As the owner says, "I'm no fool!"

The exhaust system is carefully worked out to utilize the standard VW muffler and tailpipes in a functional manner. The Chevrolet headers dump into Cadillac expansion

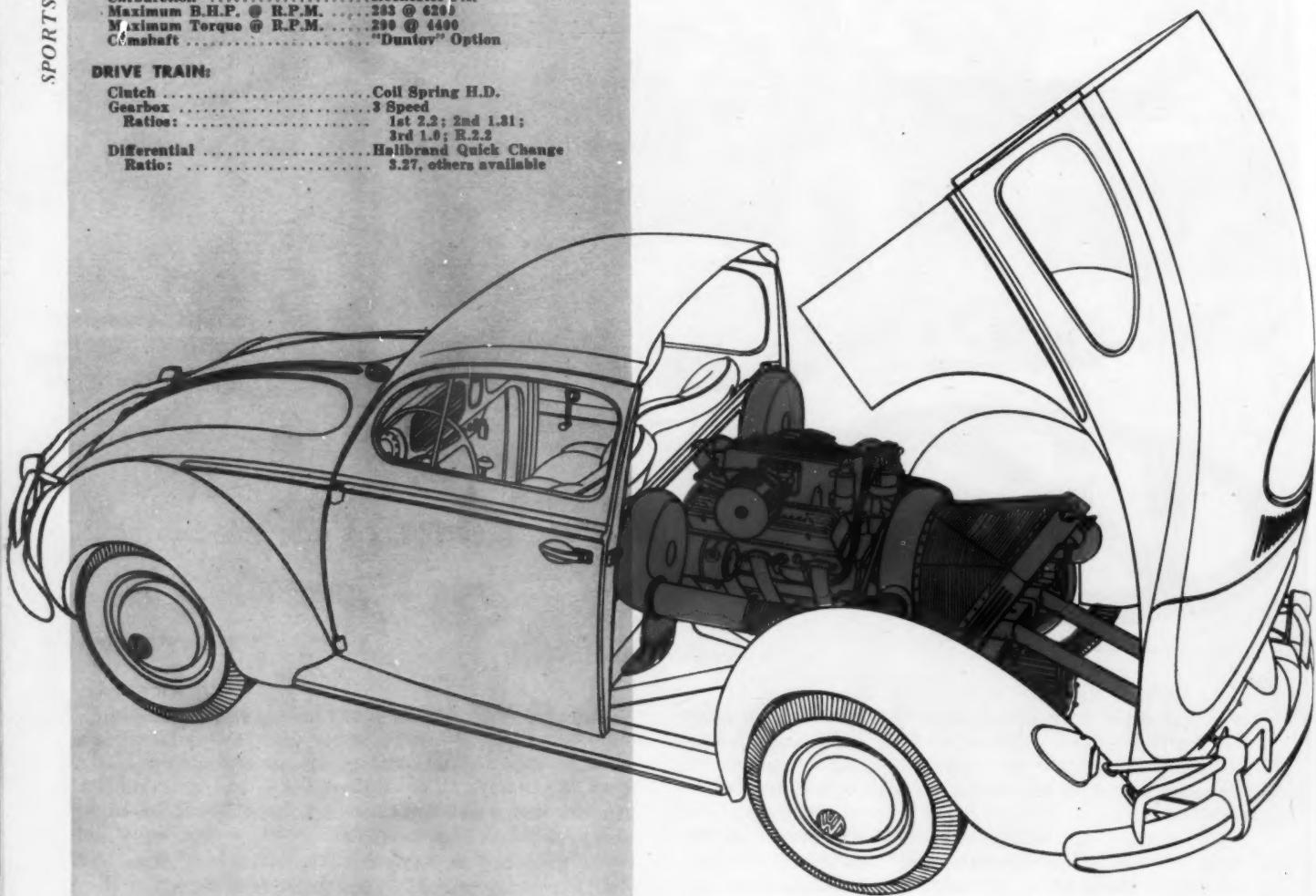
VIOLENT VW
SPECIFICATIONS

POWER UNIT:

Make	Chevrolet
Model	Corvette
Type	V-8
Valve Arrangement	P.O.H., in line
Bore	3 1/2"
Stroke	3"
Displacement	283 Cubic Inches
Compression Ratio	10.5:1
Carburetion	Rochester P.I.
Maximum B.H.P. @ R.P.M.	283 @ 6250
Maximum Torque @ R.P.M.	290 @ 4400
Camshaft	"Duntov" Option

DRIVE TRAIN:

Clutch	Coil Spring H.D.
Gearbox	3 Speed
Ratios:	1st 2.2; 2nd 1.31; 3rd 1.0; R.2.2
Differential	Holibrand Quick Change
Ratio:	3.27, others available

STAN
MOTT

CHASSIS:

Wheelbase	94.5"
Front Tread	51.0"
Rear Tread	50.0"
Weight	2107 Lbs.
Suspension, Front	Trailing Link, Torsion Bars, Anti Roll Bar
Suspension, Rear	Link, Swing Axles, Transverse Leaf Spring
Shock Absorbers	Tubular Telescopic
Steering Type	Worm, 2 piece Track Rod
Turning Circle	37'
Brake Type	Front: Porsche Spyder ATE (Lockheed) Rear: '39 Ford
Tires	5.90 x 15 Firestone SS 170

RATING FACTORS:

B.H.P. per Cu. In.	1.00
B.H.P. per Sq. In. Piston Area	3.01
Torque (FT.lb.) Cu. In.	1.02
Pounds per H.P.	.74

chambers, from which the exhaust gases are led into large bypass type mufflers. From each muffler two small pipes lead into the ports on the VW muffler, while a larger pipe directs extra exhaust straight down inside the body. The VW muffler is bolted to the rear frame crossmember in the exact relationship to body that it normally has. Exhaust sound is very nearly stock. If you are listening for a difference, you might well conclude that the car is running a blower, or perhaps an Okrasa kit.

There were two really major problems in the installation: one was cooling the engine; the other providing rear suspension. Both were solved by unusual means and both have been, if not ideal, at least satisfactory.

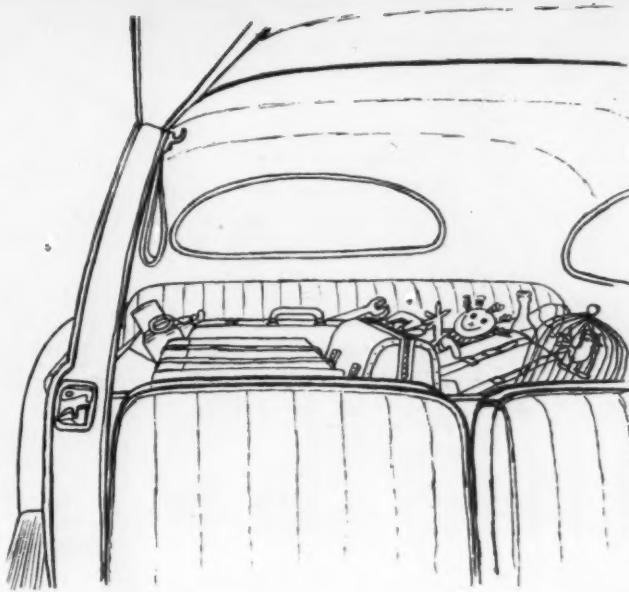
Installation of a large water-cooled engine in a car without any openings for ram air to the radiator was bound to be tough. Just how tough was realized soon after the engine was installed. The radiator, because of space limitations, had to go behind the engine. This meant routing water pipes back to it, and figuring some means of getting air through it. The solution here is exceedingly unorthodox. A Gilmer belt is used to drive the water pump and three Sirroco blowers. Two of these blowers are mounted low and forward, on a direct plane with the crankshaft pulley. These take in atmospheric air from the bottom of the car, and push it back through cardboard composition ducts into a much larger blower mounted above the differential. The large blower draws air from the VW louvres as well, and the whole volume of air is blown through the radiator, where the deck lid directs it down and out the bottom of the car. Because this cooling is marginal, a large capacity (2 quart) oil radiator is mounted in front of and below the front sus-



pension. The car is never allowed to run very long when stationary (someone might see the "speedometer" moving), so overheating has not been a great problem.

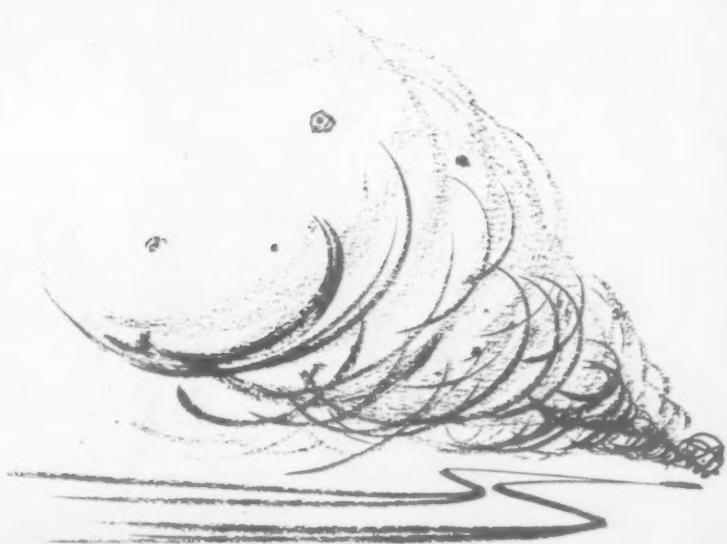
The rear suspension is a real jumble of ideas. The transverse leaf spring is pure Ford. So are the axles and brakes. But the means of tying them together are unusual indeed. Borrowing from the eight cylinder Gordini Grand Prix car, Watts linkages are used to locate the outboard portion of the swing axles, and that's it. No rigid link between differential and wheel. The Watts bars locate in three planes, and the point where the axle connects with them is rubber bushed to allow vertical movement and axle angle changes.

The finishing touch to the project lies in the cover made up to hide the installation from view through the windows. Molded of fiberglas, it gives the appearance of being several suitcases and a footlocker, very deceiving. But then, the whole thing is. Just to add to the confusion, the owner has purchased a second VW, identical in appearance to the sleeper. He figures that being seen with his children in the back seat will help keep suspicion away. And that's the whole reason for the violent VW.



To preserve the illusion, the potent powerplant of the violent one is completely hidden by fibreglass, moulded to give the appearance of several suitcases and a footlocker.

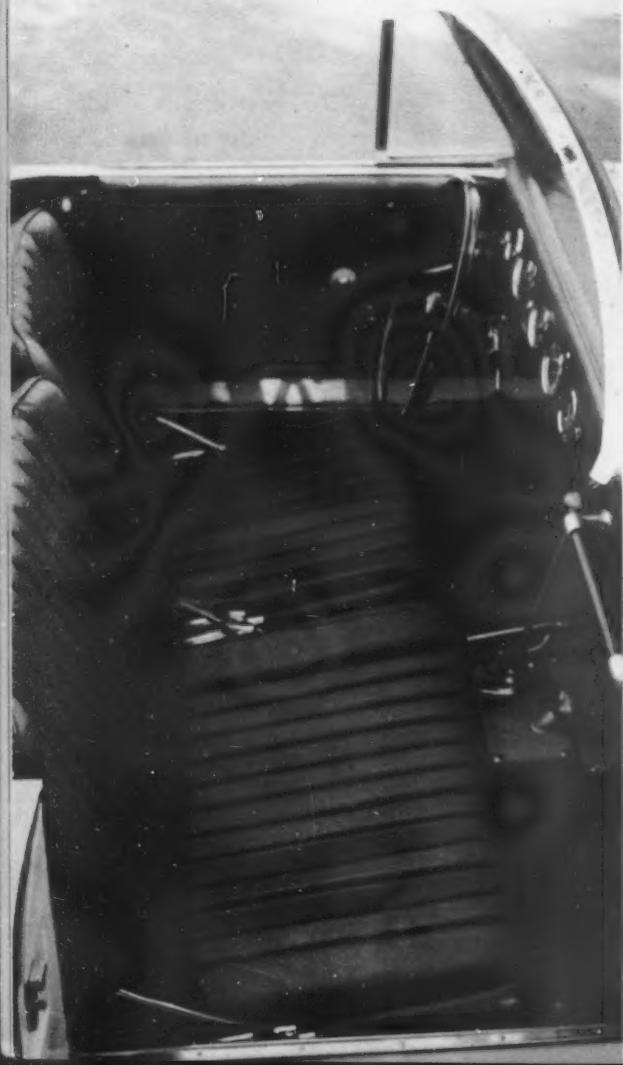
The only thing different is a fine, division line, a continuation of the door-rear panel line, that runs across the roof. The owner, who has taken great pains to remain anonymous, has another VW identical to this one, and uses it to transport his family and mask the intent of the sleeper.





**SCI ROAD TEST:
DENZEL
1300**

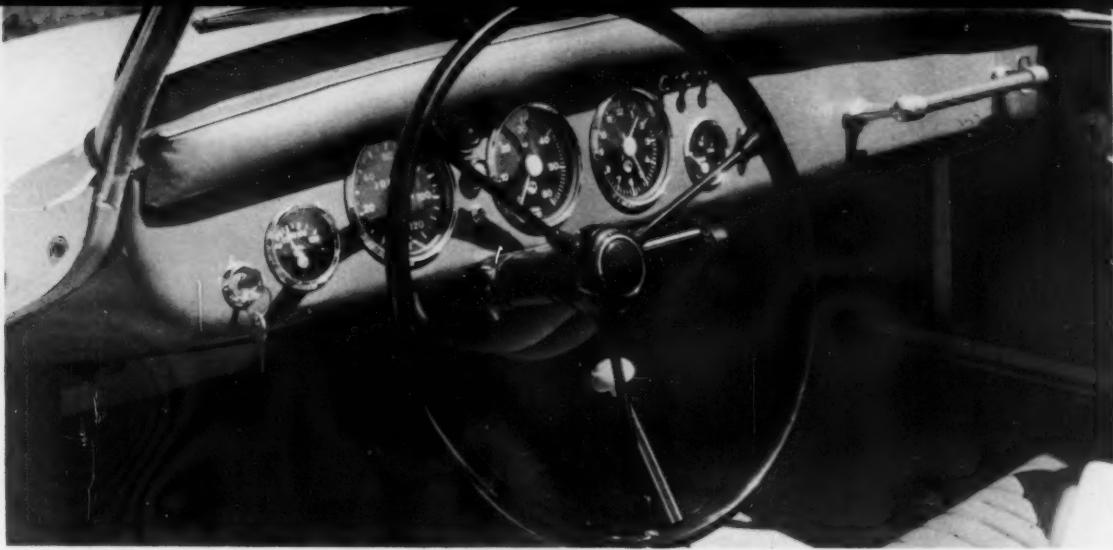
*Interior details are meticulously and finely finished.
The front seat has a $\frac{1}{3}$ - $\frac{2}{3}$ split that permits two
passengers to ride—provided that one of them is small.*



THE somewhat unusual name of Wolfgang Denzel first came to the attention of any great mass of followers of the *scene sportif* in July of 1954 when he and his navigator, Herr Troenigg, knocked off Europe's best cars and drivers in winning the Alpine rally of that year. Denzel toolled his car, which he had constructed in a shady spot in his backyard, over the passes and through the valleys of the famous course in what has been called the foulest summer weather ever recorded . . . sort of a meteorologist's sampler . . . including snowstorms and floods, with attendant washouts, detours and hazards. Although the Austrian's mount was in the under-1300cc category, reports described it as doing close to 100 mph, climbing like a frightened chamois and looking quite respectable in the company of Aston Martins, Alfa Romeos and other grandiose machinery. In any event, Denzel and Troenigg piled up the greatest number of bonus points, suffered absolutely no demerits and went home with the silverware.

Far from being a one-shot deal, the Denzel nameplate has been carried to an impressive string of Rally victories (including the 1956 Alpine) and various models of the marque have found homes in the garages of aficionados, sportsfahren and lovers of precise go-toys.

The Denzel, or WD for short, is no pace setter in appearance, nor is it anything fantastic in original engineering, being by Porsche out of Volkswagen and foaled in Vienna; but a certain aplomb in manner and demeanour tells one that here is something to go racing in. A brief demonstration ride with Wolfgang himself at the wheel is apparently an earnest convincer, if we are to credit such people as John Bolster, British road-tester. JB remarks in *Autosport* that he took a spin through Paris as a passenger in a 1500 WD and says that: "Herr Denzel doesn't hang about, if you know what I mean. As he carved his way through traffic it was obvious that the acceleration was quite out of the ordinary. The clutch was positive, to say the least, and the gear ratios extremely close, with surprisingly high first-gear speed. On top the car was geared at 20.6 mph per 1,000 rpm and we frequently exceeded 5,000 rpm on this ratio. The brakes were enormously powerful, but it was the cornering which utterly



The instrument panel, below crash padding adds a clock and a fuel gauge. Steering wheel is VW, but it's comfortable and practical. The foot pedals are full size.

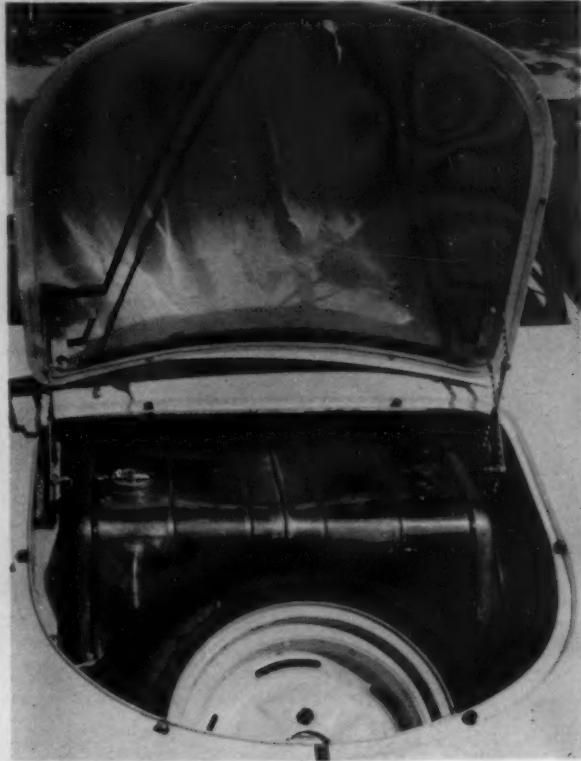
Aluminum fuel tank and spare wheel occupies all of front compartment. Tank holds 13.5 gallons—sufficient for more than 450 miles.

staggered me. It also appeared to stagger some of the Frenchmen who happened to be cruising along the Autoroute, but we weaved in and out of them and were gone before they had time to say 'Formidable!'

To stagger the Hon. Mr. Bolster is no mean feat, but we have an idea of how he felt after experiencing a similar demonstration of the 1500's little brother, the 1300 Super, with Fred Hannig playing the part of W. Denzel. As a Porsche owner we take a number of motoring benefits for granted, and we are inwardly assured that there is nothing to compare with the Stuttgart Stormer, but we are now somewhat shook up. And, after a comprehensive session in the company of the WD, we begin to appreciate the efforts of this rather obscure Austrian who has chosen to meld the Porsche-designed elements and play a strong hand even for limited stakes.

The first 1300 Super on these shores landed at San Pedro, California, on a summery Wednesday, and by Friday it was in the hands of your correspondents for a bash. Hannig & Olbrich, previously referred to in these pages as Porsche-VW specialists, have undertaken to market the WD in this area because of confidence inspired by Denzel's Volkswagen conversion kits . . . clean, precise and flawlessly turned out metal work which also goes into the namesake car. Through their good offices we were able to assimilate the features of the new vehicle and try to evaluate its place in the sports car spectrum in the light of experience gained owning and operating similar machines.

To begin with, there is a similarity between WD and



Denzel 1300, trim, compact, yet seats three. Body is all aluminum, and aluminum wheels are also "stock." The top is stowed in a compartment behind the seats and under the rear deck.





Denzel 1300 Super bears a family resemblance to Porsche, both being derived from VW. However the wheels, bumpers and in-board lights give it a personality of its own.



Driver Ed Tomerlin's comment on his approach to this turn: "I took it a tad too fast." However the WD straightened out under correction from the wheel, and was well placed for a sprint down the straightaway.

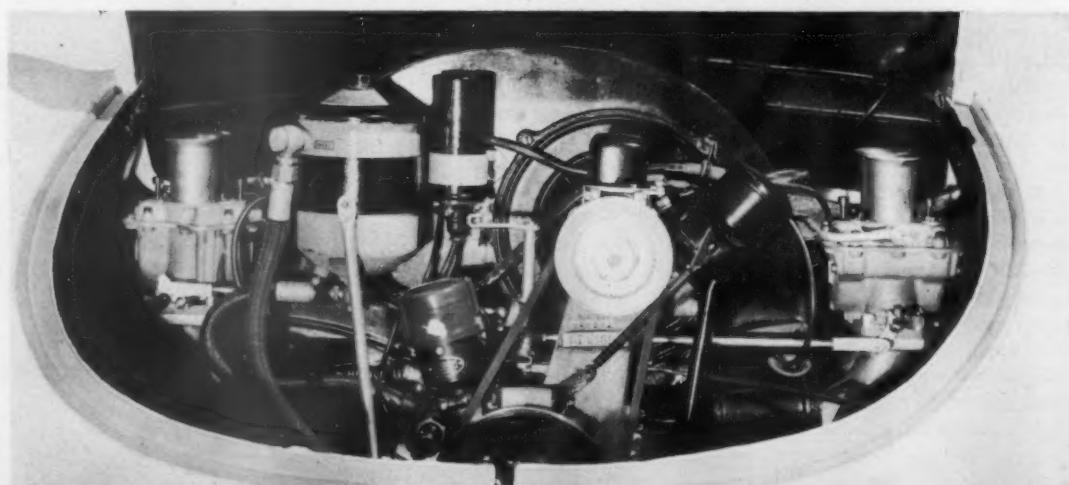
Porsche which precludes judging it on lines. Either you like the Porsche Speedster or you think it is one of the ugliest cars in the world, and, frankly, whichever way you feel would probably dictate your reactions to Denzel's roadster. The Denzel body is distinguished from the Porsche in one respect, however, in that it is all aluminum and the two speedsters would be instantly set apart by the WD's flat windshield and integral windwings. Other WD characteristics include inboard headlights and deeply inset taillights.

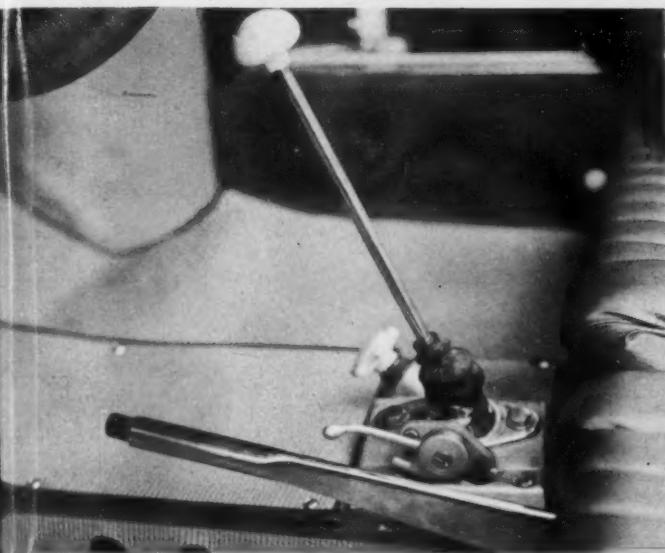
The chassis does not follow the conventional Porsche or VW plan, but is made up of round and rectangular tubing, quite light but strong. The front suspension is definitely VW and not Porsche as had been reported elsewhere.

In the back, VW trailing links, swing axles and transmission-differential cases are employed with the latter housing non-synchro gears and a limited-slip final drive. Another notable change is the placement of the lower shock mounts, which drop considerably below the axle. Denzel is reported to have spent *grosse* time and *grosse* money in research upon this important contribution to handling (some 4 years, it is said). It may be significant that Porsche have relocated their shock mounts within recent memory, possibly a left-handed tribute.

Another bit of Denzel research has been with tires, and it is noted that while Pirellis are fitted when the car is ordered for touring only, Austrian *Semperits* come with it

The rear deck lifts to show a VW engine with a displacement of 1281 cc, producing 65 hp (DIN). Engine is hardly stock, using new heads, a roller-bearing crank and a wicked cam.





In order from the driver's side: polished handbrake is out of the driver's way when released; small lever above brake is manual spark control, seldom seen on modern cars; shift lever controls four-speed crash box; circular knob is heater control.

for closed course racing. Maximum cornering power is ascribed to this tread, which somewhat resembles Englebert's worthy *Stabimax*. This was our first experience with the *Semperit*. We don't know how much was tire and how much was Denzel, but they stuck well in our tests.

Corning the WD is more like the Porsche Spyder than the Porsche Speedster because of the limited-slip differential and its tendency to stick rather than "wisch," but in other characteristics the Speedster must be used as a yardstick. Make no mistake, the 1300 doesn't have to apologize for its lack of displacement. With less than 1,300 lbs. to haul, it's off the line in a hurry. And with more brake lining area than the Porsche to rely on, it can go deep into a turn with the driver looking over his shoulder at the opposition.

65 DIN horsepower at 5,400 rpm is claimed from the 1281 cc air-cooled engine which employs a VW crankcase and cooling system. Denzel goodies which are attached to and stuffed into the case include light-alloy cylinder sleeves of 78mm bore (3.07 in.), forged, polished rods, aluminum pistons, inclined-valve OHV heads, tubular pushrods, a rather wicked cam, and a roller bearing crank with 67mm stroke (2.63 in.). The horsepower rating given here, incidentally, is for the model fitting Solex 40 P11 carburetors and having an 8.5:1 compression ratio. Our test car carries the optional dual-throat Webers and approximately 9.9:1 compression, which, of course, will up the performance somewhat.

Speaking of options, apparently the sky is the limit and the best plan is to tell Wolfgang what you have in mind for the car and sit back to await the pleasant news. Aluminum wheels are stock items, and you can't do much better than that; but you can select from a variety of final drive ratios if you so desire. The roadster now being described was ordered with the notation that it would probably be used for short-course racing, descriptive of our West Coast tracks, so it came in with about a 4.37 rear end, close ratio 3rd and 4th and a long-winding second. Neat? This is a series production car and eligible for production races, states the manufacturer.

As a matter of fact it is so "production" that it has a fixed safety-glass windshield which is non-removable, and full seats suitable for a driver and two passengers. Herr Denzel is not building a racing car, in other words, but is offering

(Continued on page 55)

1300 DENZEL SUPER

PERFORMANCE

TOP SPEED:

(estimated) 110 mph

ACCELERATION:

From zero to	seconds
30 mph	6.0
40 mph	7.5
50 mph	9.4
60 mph	12.3
70 mph	16.0
80 mph	20.0
Standing $\frac{1}{4}$ mile	17.7
Speed at end of quarter	77.7 mph

SPEEDOMETER CORRECTION:

Indicated	Actual
30	29
40	39
50	48
60	57

FUEL CONSUMPTION:

Approximately 20 mpg during tests, 34 mpg under touring conditions.

BRAKING EFFICIENCY:

No discernible fade.

SPECIFICATIONS

POWER UNIT:

Type	4 cylinder opposed, air cooled
Valve Arrangement	pushrod operated OHV
Bore & Stroke	3.07 x 2.63 ins. (78 x 67 mm)
Stroke/Bore Ratio	.85/1
Displacement	78.1 cu. ins. (1281 cc)
Compression Ratio	9.9:1 (test car)
Carburetion by	dual-throat Weber, down draft
Max. bhp @ rpm	65 @ 5400 (DIN)
Idle Speed	1000 rpm

DRIVE TRAIN:

Rear end ratio	4.37 approx.
Ratios in the gears	optional as ordered

CHASSIS:

Wheelbase	82 in.
Tread	52 in. front & rear
Suspension, front	Trailing link, laminated torsion bars
Suspension, rear	Trailing arm, laminated torsion bars, swing axle.
Shock absorbers	Telescopic
Tire size	3.25/15

GENERAL:

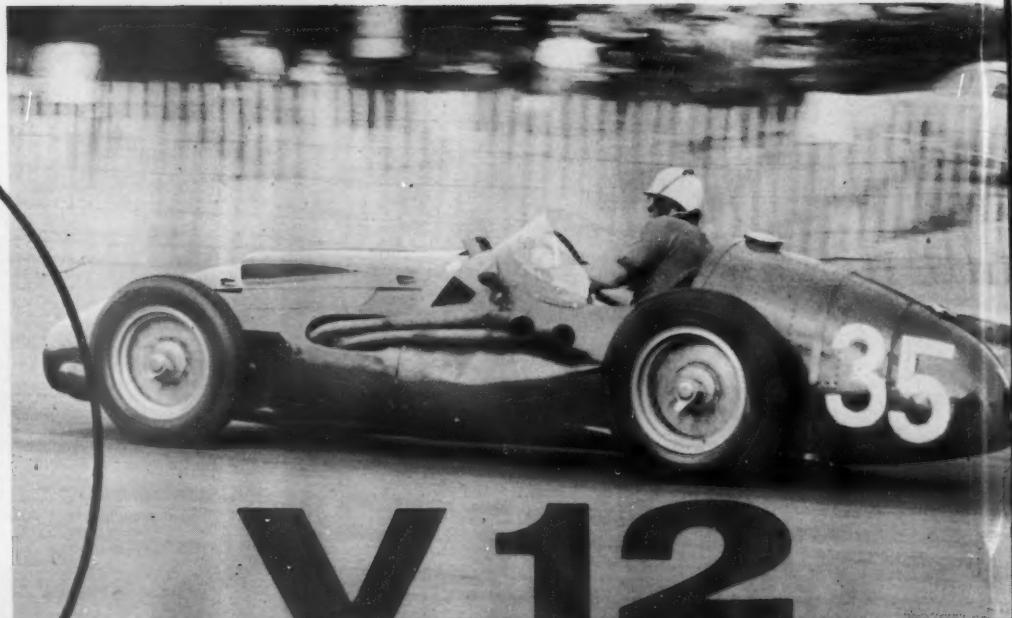
Length	141 in.
Width	64.5 in.
Height	57.5 in.
Ground clearance	7 in.
Weight, test car	1281 lbs.
Fuel Capacity	13.5 U.S. gallons

RATING FACTORS:

Bhp per cu in.	1.20
Bhp per sq in. piston area	2.41
Pounds per bhp	19
Piston speed @ 60 mph	1460 fpm
Piston speed @ max bhp	2367 fpm
Brake lining area per ton	190 sq in.

Acceleration runs at electrically timed drag-strip showed that Denzel could out-drag TRs, Porsche 1500, and run about even to Jags with best run of 17.7 sec at 77.7 mph. Beats the VWs too.





V12 MASERATI

An SCI Staff Report

1957 was an important season for the Brothers Orsi—for the first time ever, the World Drivers' Championship had been won on their Maseratis. This achievement was in no way diminished by the fact that it was Fangio who won it, and that he had managed to win it four times previously on three other makes of cars. Precisely and because of this, the Orsis were well aware that this year's winning car is not necessarily the mount for next year's winner. Three of the last four Grandes Epreuves were lost to the Vanwall, a car whose full potential has not yet been exploited. This only served to emphasize that the six cylinder Maserati 250F, first raced in 1954 and no spring chicken, has perhaps seen its best days.

As early as mid-'56 it was rumored that 1958 would see the beginning of "gasoline GPs." Now this is all very well for the race promoters who will get a good advertising tie-in with the oil companies, but it's a bit awkward for the designers. That is, if they don't want to see sports cars lapping faster than the GP cars. Alcohol has one big advantage over gasoline—its much greater "latent heat of evaporation." If you've ever spilled rubbing alcohol on your skin, you've noticed that it's more chilling than water or gasoline. Similarly, inside the intake manifolds and cylinders, alky chills the air and fuel mixture more than gasoline does, enabling greater power to be obtained for any given peak temperature.

No one would believe, after watching a Maserati pit-stop, that they even knew the meaning of Plan Ahead; but in September 1956 Omer Orsi called in his chief engineer, Alfieri, for a consultation. The result of this meeting was that Alfieri was to design a new engine that could be placed in the 250F chassis and tested on the actual GP circuits throughout the 1957 season.

Alfieri reasoned that by using a shorter bore and stroke and turning more pistons at higher revs, he could more than make up for the power lost by going "on the wagon." With a wealth of successful small-cylinder experience behind him in motorcycle racing, this was right up his alley. Within days he was able to lay the plans for a V-12 engine before the

Orsis. Proposed output? An incredible 300 bhp from only 152 cubic inches. Plans were enthusiastically approved and the twelve went on the drafting boards, with a problem or two yet to be ironed out.

Even if the twelve was to be a more efficient gasoline burner than the six, it was almost certain to be bulkier and heavier. The Orsis were pleasantly surprised when Alfieri showed them his finished engine—a twelve that actually weighed a bit less than the six.

It was no miracle; it was sound engineering and an alertness to new developments in metallurgy. All the main castings were as thin as could be, using a new featherweight alloy. All parts were designed to be highly-stressed, and those most prone to fatigue were reinforced with cast-in stiffening ribs. More expensive than usual, but races aren't won on shoestring budgets.

Early in 1957, the engine was bench tested with almost unbelievable results. It ran the whole test without hesitation, and its peak output was ten horsepower more than was ever taken from the six-cylinder design, namely 280 hp at 9500 rpm.

The engine was dropped into a discarded '56 chassis. Fantuzzi, coachbuilder for Maserati, beat out a rough body. A hole was cut into the hood for carburetor air intake, and the car was hurried off to the Modena Autodrome for testing.

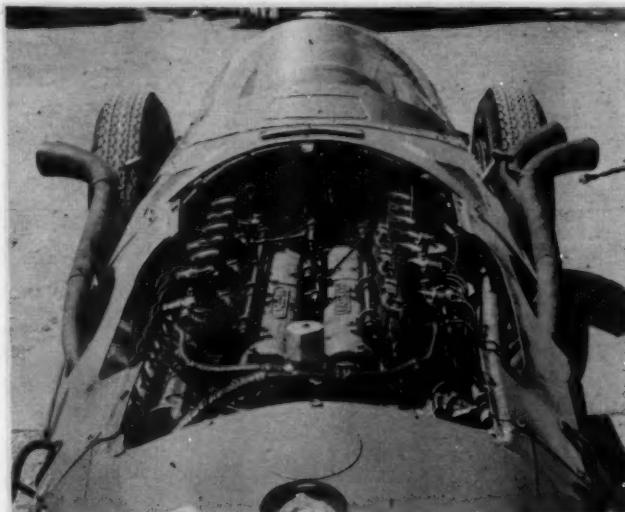
Fangio took it around for several laps. There was plenty of bugs, all right. All the power came in at one time, and there was next to nothing at the bottom end. The Old Man just shook his head sadly.

However, the best way to test a race car is to race it, so it was decided to try it at Syracuse. The air scoop at the front was cleaned up and the air intake divided into two separate tunnels. The engine stayed on the test stand until the last minute in an effort to achieve a little more torque at the bottom end. During practice everyone on the team tried the car—and all of them just about scared themselves stiff. The power curve was still too uneven.

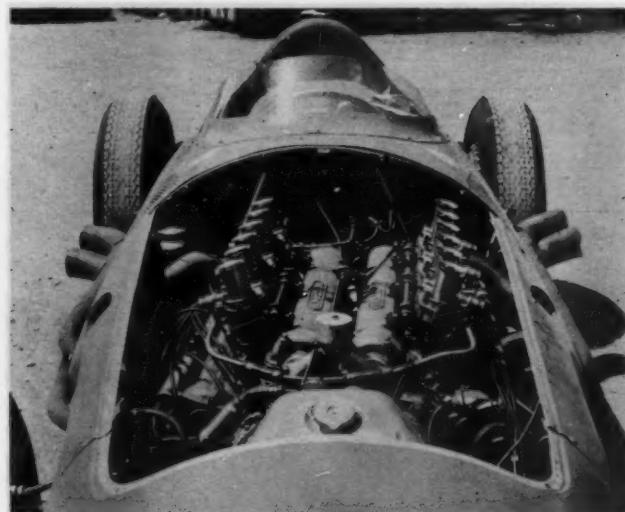
Back at the factory again, the Solex carburetors were discarded in favor of specially-prepared Webers, and mega-



At Monaco's round-the-houses GP, the team drivers took turns trying out the second prototype V-12. Harry Schell wheels it past the famous Casino, at LEFT, trying his best but to no avail. No one on the team could go as fast in it as they could in the six. Next car, seen at right, ABOVE & BELOW, was more successful. Externally, major changes include exhaust position, size of radiator intake, shape and location of carburetor intake scoops. Brakes on both are the same, but have since been changed.



First changes from original V-12 engine (see next page) was switch to Webers and installation of breathers on both sides of crankcase to reduce oil frothing problems.



Next step was new chassis carrying engine at 5° angle, passing driveshaft to side of driver. Intake manifolds were altered, and radiator now includes header tank.

phones were tied to the ends of the pipes. New tests showed over 300 hp at 10,000 rpm.

A new chassis with an 88.5 inch wheelbase was made for Monte Carlo replacing the 89.75 inch 1956 chassis. Weight was reduced 30 pounds to about 1450 lbs.

In practice, it was evident that the torque curve was a lot better; but it was still tricky to handle. In fact, Fangio was the only one who found the combination. He evolved a technique for keeping the revs up, and eventually turned a lap at 1:46 (but his best lap in the six was 1:42).

During practice the drivers thrashed it around quite a bit, and proved that if nothing else, the power plant was sturdy, reliable, and very noisy. Since the car had covered more distance than it would in the race and was definitely not as fast as the six, it was not started, much to the disappointment of the crowd, who if nothing else appreciated its noise.

Maserati engineering then began work on a chassis for the new engine. The 1956 lightweight frame was selected as a starting point, and when completed the new skeleton lowered the weight even further—to 1375 lbs.—even though the wheel base was stretched out to 90.5 inches. The five degree offset of the engine, as used at Monza in 1956, made it possible to lower the driver's seat, creating the illusion of an even longer car.

This completely new car went to the Modena Autodrome, in the care of Behra and Scarlatti. "Phenomenal," said Behra; "Magnifico," cried Scarlatti. "With this car we can win at Reims." And they might have—except Menditeguy blew the car up.

This left Maserati with two problems: Menditeguy solved the first by leaving; the design department solved the second by locating the cause of the failure—small cracks across the webs of the connecting rods. Stronger rods were designed and installed, and Fangio took the car to Imola. He climbed in, took three warm-up laps, and beat the track record by a full second. Satisfied, he gave the car his personal OK—an appreciative pat on the cowl.

Alfieri had built him a good car, and in so doing he went into concepts that had never before been investigated by Maserati. For one thing, he believed in getting his power through high rpm, using an ultra short stroke to keep the piston speed within the useable limit of 4000 feet per minute. With a stroke of 2.20 inches (56 mm), 10,000 rpm sees a piston speed of only 3670 fpm; but the peak piston acceleration, which determines wrist-pin and bearing loads, is at the fantastic figure of 204,000 ft/sec² . . . some 60% higher than normal limits!

To understand how the engine manages to hold together

JANUARY '58

MASERATI V-12 FORMULA 1

SPECIFICATIONS

POWER UNIT:

Type	60° V-12
Valve Arrangement	Four ohc
Bore & Stroke	2.69 x 2.20 in. (68.5 x 56 mm)
Stroke/Bore Ratio	6.82/1
Displacement	151 cu. in. (2475 cc)
Compression Ratio	12.9 or 12.4/1
Carburetion by	Six Weber 35 IDM twin choke down draft
Max. Power	320 bhp @ 9250 rpm (tested 7 August 1957)

DRIVE TRAIN:

Reduction gear ratios (behind clutch)	0.73, 0.74, 0.79
Bevel gear ratios (transmission input)	0.67, 0.65, 0.58, 0.55
Transmission ratios	
I	0.45, 0.40
II	0.60, 0.52
III	0.80, 0.75
IV	1.00, 0.90
V	1.50, 1.20
Final drive spur gear ratios	2.23, 2.16

CHASSIS:

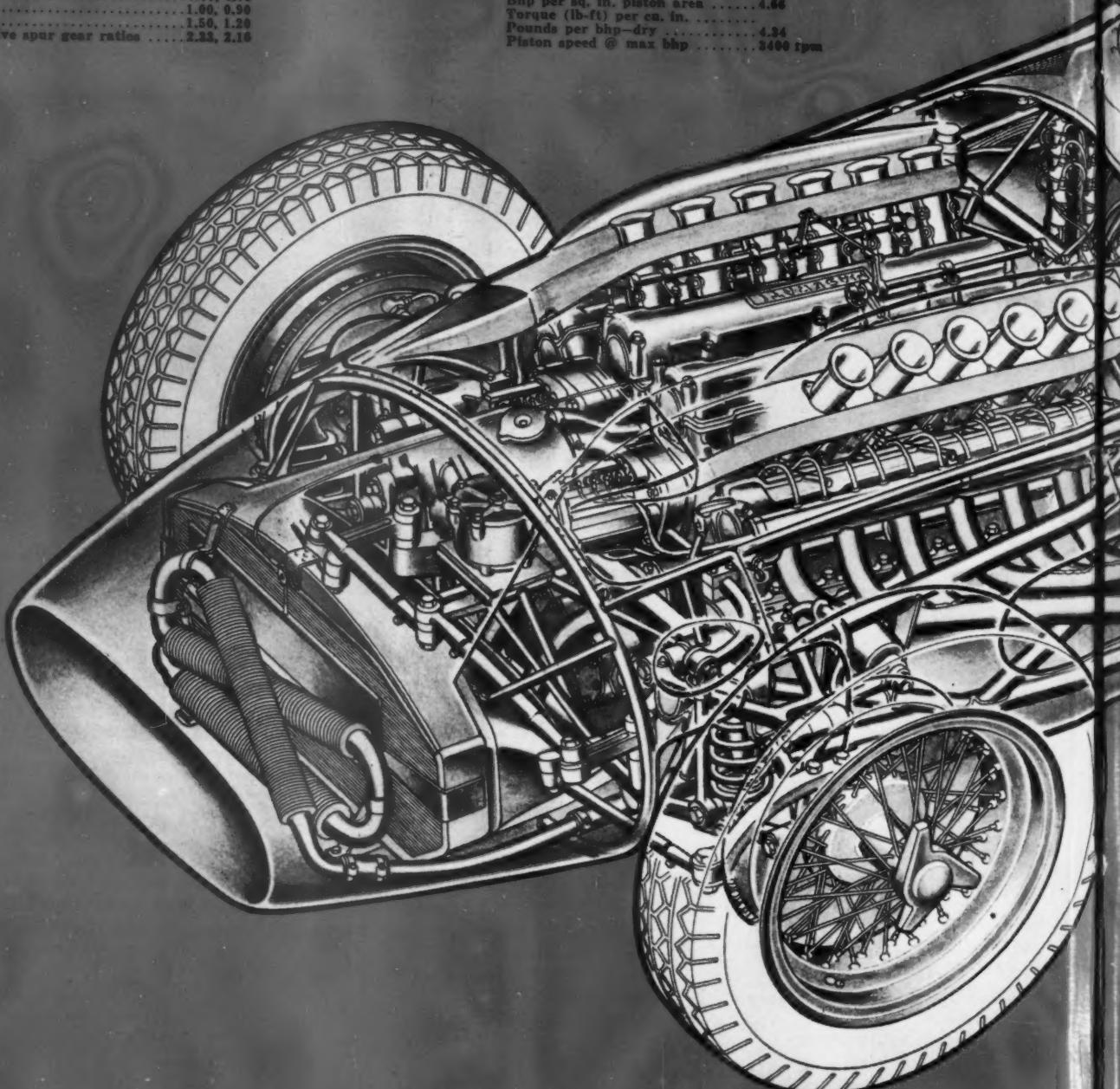
Wheelbase	98 1/2 in.
Front Tread	51 in.
Rear Tread	49 in.
Suspension, front	Independent, unequal wishbones, coil springs, anti-roll bar
Suspension, rear	deDion, parallel trailing arms, transverse leaf spring
Shock absorbers	Girling telescopic (Houdaille on prototype)
Steering type	Worm and sector
Turning diameter	40 ft.
Brake type	2 LB with two master cylinders
Tire size	5.50 or 6.00 x 16 front, 7.00 x 16 rear

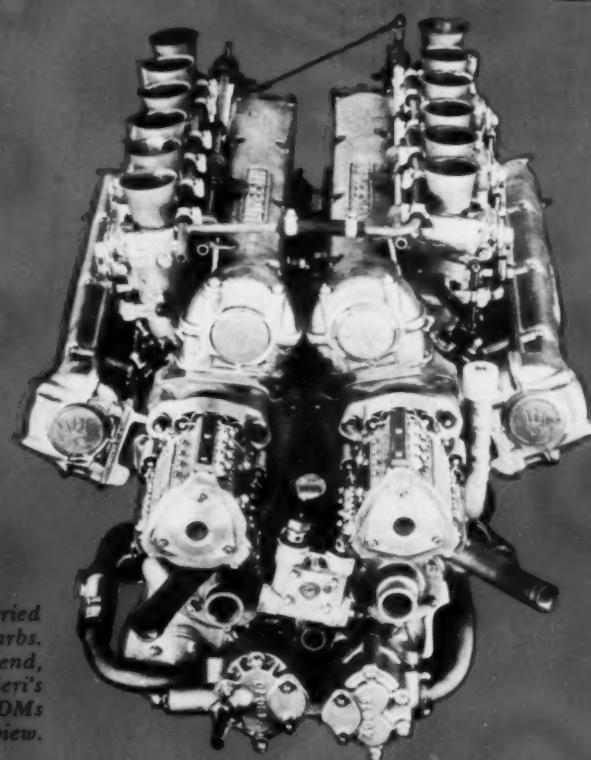
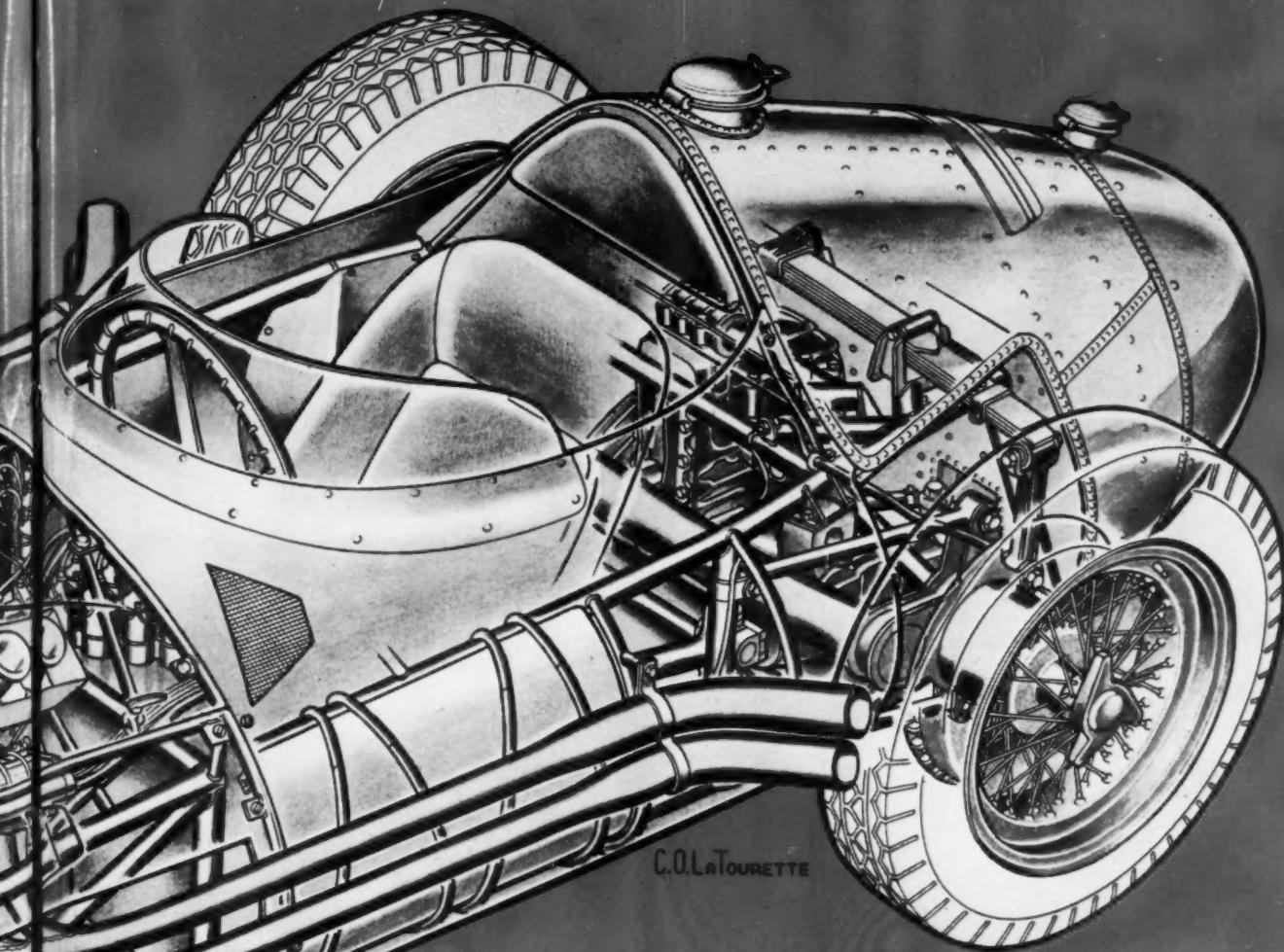
GENERAL:

Length	177 in.
Width	65 in.
Height	35 1/2 in.
Weight, dry	1375 lbs.
Fuel capacity—U.S. gallons	79 in three tanks

RATING FACTORS:

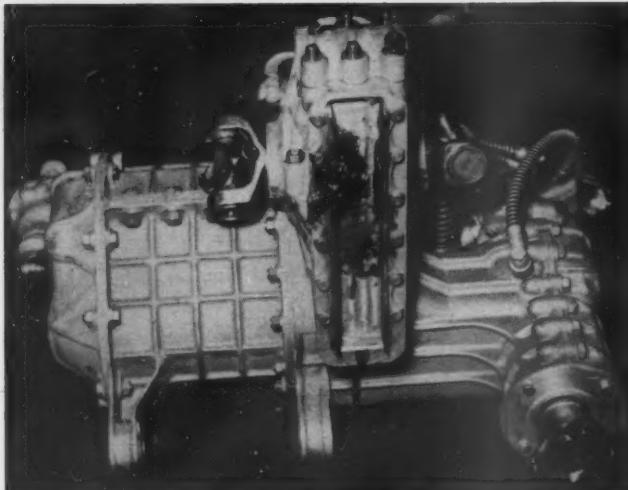
Bhp per cu. in.	3.12
Bhp per sq. in. piston area	4.66
Torque (lb-ft) per cu. in.	
Pounds per bhp—dry	4.34
Piston speed @ max bhp	3400 rpm



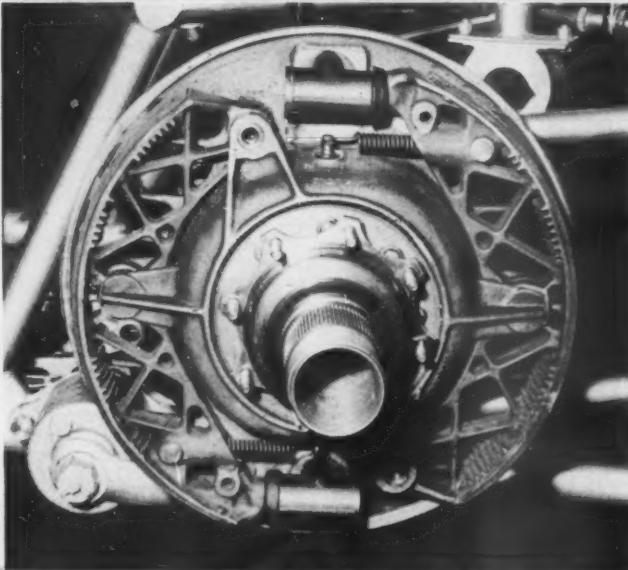


Very first V-12 mill (right) carried 6 Solex twin-choke down-draft carbs. Too little torque at the bottom end, so Weber in Bologna came to Alfieri's aid with specially designed 35 IDMs which are seen in the cutaway view.

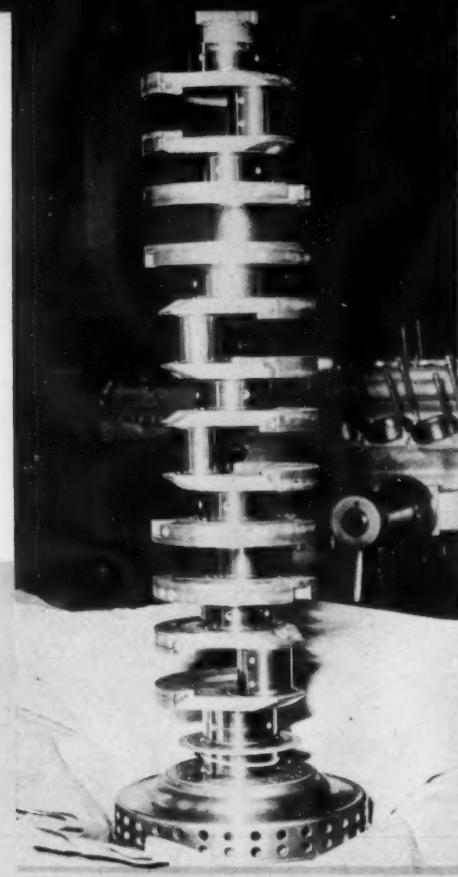
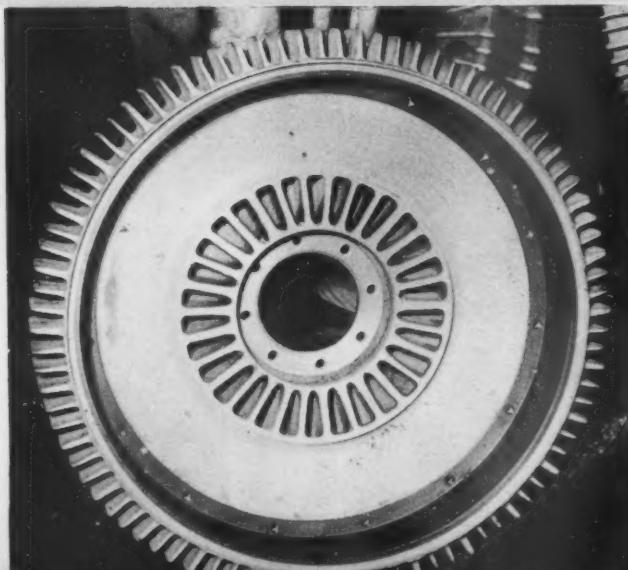
To avoid arcing within distributor's cap due to tiny space between 24 closely spaced high voltage contacts, Alfieri did away with its high-tension functions by providing twenty-four coils and condensers, 2 per cylinder.



Front of gearbox (above) attaches three places to tube frame. Engine torque, already multiplied at step-down gears behind clutch, arrives at lower right, exits at top after a maze of gears, both step-up and step-down, spiral and bevel.

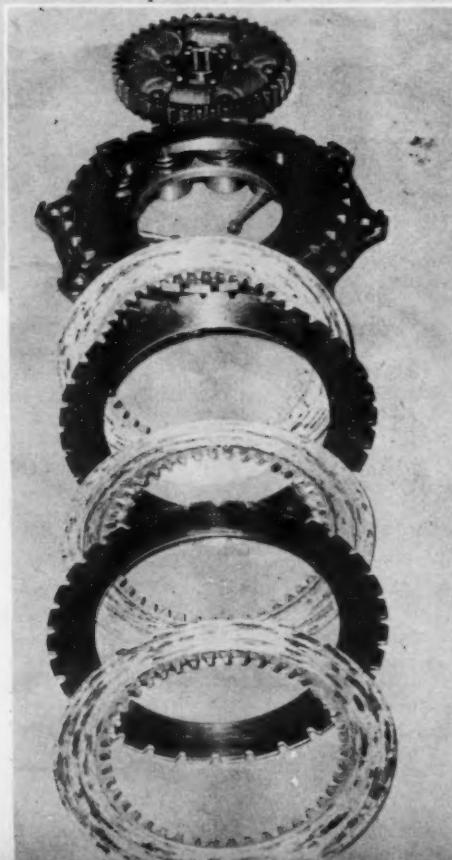


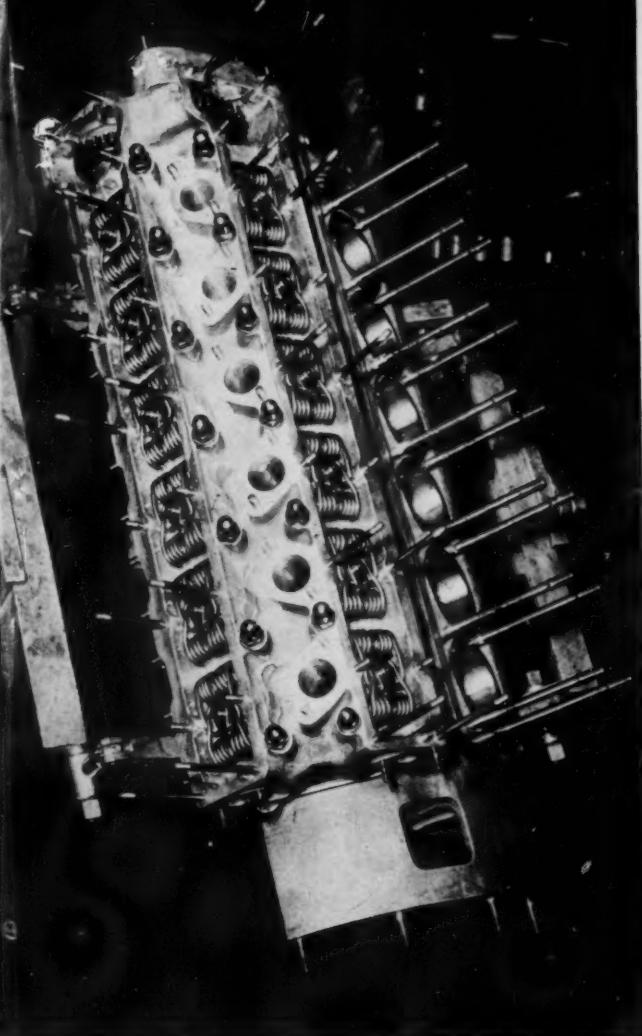
Two-leading-shoe brakes feature fins on inside of light-weight, truss-like shoes, sturdy pivot points, lateral locating guides and well-ventilated backing plates. Latest drums (below), reduced from the 450S', carry huge, blade-like fins on periphery and internal webs near hub.



Six throw, seven main bearing crankshaft has extra balance weights welded on after journals have been ground. Drilled out "flywheel" is merely a housing for . . .

. . . the multiple disc clutch. Two driving discs and the pressure plate are splined to the flywheel, while the driven ones are splined to hub, thence to shaft.

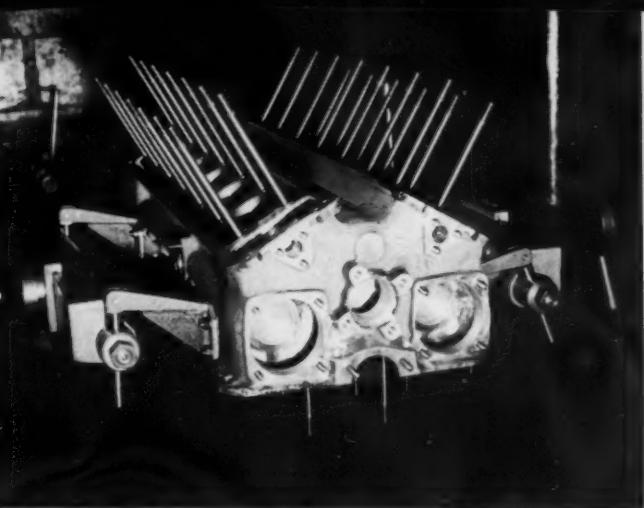




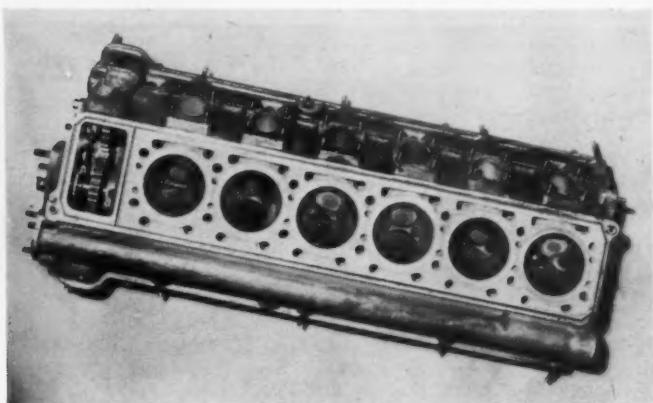
Intake ports between the camshafts were forced by the crowded 60° Vee. Hairpin valve springs are lower than coils, won't "crash", but take up more room lengthwise.

while putting out its record-breaking horsepower, we must turn our attention to its details of construction.

The block extends from the top of the cylinder banks to the center line of the crankshaft. The upper section of the block, following the practice employed in the straight six, is actually two light alloy tanks, each surrounding six nitrided-iron wet cylinder barrels. The cylinders, however, are more widely spaced than previously, and the mating flats, used by Bellentani to prevent rotation of the liners, have been



All accessory drives are within the short, squat crankcase. Enormous main bearing caps attached with four studs each. Another twenty-eight studs attach the two cylinder heads.



Cylinder head contains idler gears and drive to cams, built-in water return gallery alongside intake valves. Exhaust ports seem nearly as large as valve head diameter.

eliminated. Because of improvements in engine assembly technique, Alfieri felt they were an unnecessary precaution.

The crankshaft has seven main bearings, each one supported by a thoroughly-ribbed web cast into the block. The bearing caps are each attached by two long studs running well into the block, and two short ones. This uses what little depth the crankcase has to advantage, distributing the crankshaft loads fairly equally top and bottom. The two cylinder

(Continued on page 58)



After breaking the lap record at Imola by a full second, Fangio makes a few comments. Listening, L to R, are Alfieri, the two Bertocchis, Guerrino and Aurelio, Perdisa and a mechanic.



The Irish Way. It's better than road racing!

Just For Fun

by Hugh McGrillen

IRISH motor racing got a hard knock in 1955 after the Ulster Tourist Trophy Race at Dundrod. In this, probably the U.K.'s greatest, true road race, there were two pile-ups involving the deaths of three competitors. That spelt the end to major motor-racing in Ireland. The race had been a gigantic struggle between the Mercedes Benz team of 300 SLR's, a lone Jaguar, and a formidable combination of Ferrari's, Maseratis and Aston Martins—with the Merc dynasty scoring a last minute 1-2-3 win from Mike Hawthorn in the lone Jag.

All these good times were three years ago, and since then wringing of hands and beating of breasts have been the order of business. Apart from a few very-local, benefit gallops, motor racing just isn't. At this point the man who knows his motor enthusiasts inquires as to what is happening instead.

With the cream gone from the sporting diet, trials and rallies have made a comeback, and the Cross-Roads-Dice has come into its own again. Now we lay no claim to a monopoly of the C.R.D. in Ireland, but there is a hardy band of Dicers in circulation here who accept no masters in this specialised branch of motor-sport.

The Cross Roads Dice is a title for a cutthroat battle which is waged on one side by officials or promoters, and on the other by competitors. The officials fix a date for a trial event and go into a huddle to produce a route of about 80 or 100 miles through varied road systems. Into this, they insert about eight or ten check points at each of which they cook-up a sinister, deadly car trap. These car traps are designed to do vital damage to any car or competitor who chances along; or so the officials think. I should have mentioned that these car traps are euphemistically referred to as driving tests in official language; to the competitor they are known as a dice, of course.

Having selected their various spots, the back-room boys descend with white paint, pylons and other tools, such as stopwatches and a flag or two. Then on the cross roads, road

junction or wherever they have picked, they set up the pylons, paint lines, and sit back with leers of sadistic satisfaction; "This one'll fix em." Up comes the first competitor, 30 seconds ahead of schedule—gets out and has a quick look at the "trap." Of course he has already been issued regulations which give written directions for each test. Having had a good look, he assumes a slightly amused sneer, ignores all officials but the man with the flag, steps back into the car, and waits for the "off."

At the fall of the flag, with revs at peak, he proceeds to hurl the car in and out between the pylons across the lines and, generally speaking, makes it do things that its makers never dreamed of. Having completed this little maneuver, the officials usually find that their scheme has been disposed of, without penalty, in less time than it took you to read this.

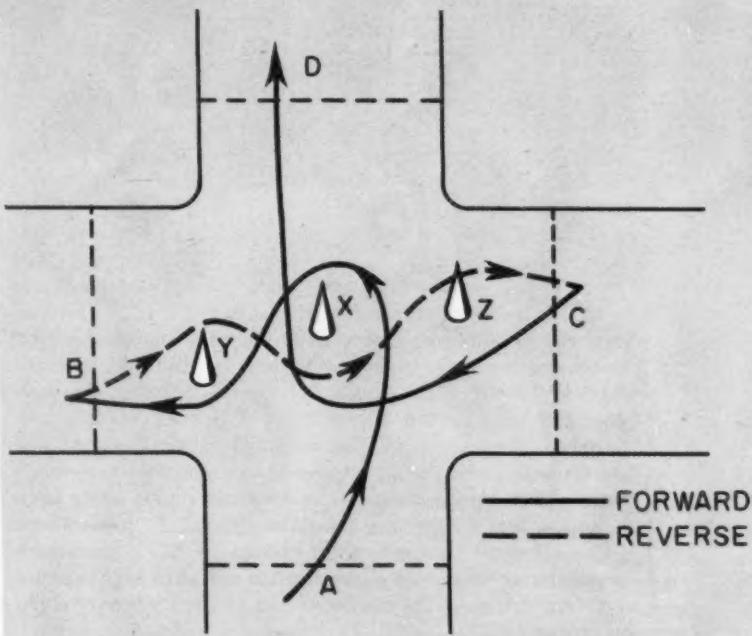
As a guide to what these driving tests can be, the instructions would read something as follows: "start from line A, and drive to line B, keeping Pylon X on the left and Pylon Y on the right. Cross line B (front wheels), drive from line B to line C (in reverse) keeping Pylon Y on the left, Pylon X on the right and Pylon Z on the left. Cross line C (front wheels), drive from line C to line D, keeping Pylons Z and X on the right. Finish over line D."

Nothing to it? Well take a stop-watch out the next time you are near a free section of road, and have a go. And if you are sporting Detroit iron at the moment, don't try too hard. Machinery for this sort of caper is of a fairly special type. It is by pure chance that one or two modern production sedans turned out to be ideal instruments for the game. It should be added, too, that some sedans, in the hands of the top-liners, have appeared a lot better than they really are.

The essentials of the proper machinery are a short wheelbase, a small turning circle (anything over 34 feet is bad news), high torque in the lower gears, a centrally placed pull-up-type hand brake, and a good power-weight-ratio.



Whether it's wet or dry, Triumph TR2's and 3's (left) are quick cars that sit down well on the turns in the hardest dices. Volkswagens also give very good performances. Cecil Vard "bends" back axle of his VW.



Instructions: "Starting on line A drive to line B, keeping pylon X on the left and pylon Y on the right. Cross line B (front wheels), drive to line C (in reverse) keeping pylon Y on the left and pylon X on the right. Cross line C (rear wheels) and drive to line D, keeping pylons X and Z on right. Finish over line D." BELOW: Paddy Hopkirk in Ford Anglia, performing routine circuit at Airfield Driving Tests, Baldonnel, Dublin.



Inevitably the VW pops up, and it has had a phenomenal success record against all types of specials in the last four or five years in Ireland. There are only a few, clear cut reasons for this success: one is the weight-distribution, with special reference to the driving wheels, and the other is the happy gear-ratios right through the range. But probably the most significant is an early piece of good fortune in the drivers who tried them out as a possible combination of sports machine and bread-and-butter car. These particular drivers could put a bull-dozer into the sporting category if there were big enough roads. The names which are now in the international class, Paddy Hopkirk, Cecil Vard, Declan O'Leary are, or were originally, all VW men.

Paddy Hopkirk has gathered pots all over Europe in TR 2's and 3's, and has demonstrated in various big rallies (most memorably the Alpine of last year) the margin between the best and next-to-best in driving tests. In his Volkswagen days, about three or four years ago, Paddy won the National Trial Championships (Hewison Trophy), and just for the heck of it seems well on his way to doing it again this year in his own almost-standard Ford Anglia Sedan.

This all goes to prove one thing. That while certain fundamental conditions must be satisfied in the car, the driver is the key to the awards.

Names like Vard, Bigger, Adams and others are an indication of the standard of Irish competitors in world ranking. The Cross-Roads-Dice is a most exact science; it demands complete mastery of the peculiarities of car behaviour, and combined with the road sections of the local trials and short rallies, it acts as the best training ground for the international rally series.

The big local event this year is the Irish Rally. It collects all the local boys and some visitors in a bonanza dice, covering nearly a thousand miles of Irish roads in one all-night session and two day sections. Last year's event shook some of the huskiest dicers to their foundations. In the all night session, followed without stop except for breakfast by an all day session, the competitors and cars took such a hammering that the promoters allowed themselves a smirk, for once, in the belief that they had at last won a round of the eternal battle.

When they checked up, however, before the start of the final leg, they found only four retrials and there were still a lot of clean sheets in the competition. The event was finally won by "T.P." O'Connell in a Volkswagen (VW's won the team prize, too) beating a formidable array of TR's MG's, D.K.W.'s and other rapid machinery.

There are those who say that this trials racket is a disease, and I'm not too sure but that they are right. Once it has got a hold on its victim, it's all over. His wife either becomes the navigator or a trials widow. Weather holds no fears for these crusaders. The muddier they get the better they like it, and it never really gets interesting until there is a good skin of ice on the road.

Trials are a form of motor-sport that you have to make a decision about. Try it once, and when you come home think about it for a long time. If you try it twice you've had it — you're in.

—Hugh McGrillen



the FABULOUS VAUXHALLS

by Dennis May

GENERAL MOTORS Corporation counteracted De-lilah's haircut job on Samson when, in their economic wisdom, they acquired the dwindling assets of Vauxhall Motors thirty-two years ago, and set to work imprinting Detroit's stamp on a British marque previously renowned for rakeshell sports and racing cars. Today, securely entrenched behind a rationalised range of family sedans that mirror the parent empire's policies, Vauxhall react joylessly to reminders of the make's pre-GMC prowess in famous theaters of speed.

The old company's racing and sports car ventures were mostly marked by a sort of inspired inadvertence. The legendary 30/98, for instance, "came into existence by accident", to quote Laurence Pomeroy, son of the man who accidentally designed it. Then, with 130 bhp out of 4½ litres unblown, the three twin-ohc Vauxhalls produced specially for the 1914 French Grand Prix were probably the most powerful cars in this historic Lyons lineup; yet not one lasted the course. Later, however, when the makers were almost past caring what happened to them, they won many races under conditions and over distances they'd never been intended for. As for the fabulous 1922 T.T. jobs, whose Ricardo-designed engines were chosen by SCI's Ludvigsen to point a nothing-new-under-the-sun moral in his "Whence come the horses?", the circumstances of their genesis verged on fantasy.

Presumably not later than the summer of '21, it was decided by the AIACR (predecessors to the FIA) that the new Grand Prix formula for the 1922/25 period should be based on a displacement limit of 2 litres. The Royal Automobile Club, as Britain's eyes, ears and larynx in the AIACR council chamber, might have been expected to be privy to this resolution, but apparently it wasn't. Regulations for the U.K.'s own *grande épreuve*, the Tourist Trophy—a Grand Prix in everything except name—were therefore framed around the first formula that popped into the RAC's head. This was a maximum of *three* litres. Consequently, continental constructors unanimously ignored the T.T. and the astronomically expensive cars built by Vauxhall for this Isle of Man contest were thereafter useless for any race with GP pretensions.

Yet here again, in the long run, all was not in vain. Although hardly more eligible for the Grand Prix than a butler's tray, the T.T. Vauxhall was of such superb design that nothing could hold it down in the many branches of speedwork it subsequently invaded in the hands of distinguished private owners. These included track races at Brooklands, record breaking, hillclimbs galore, speed trials, and beach events. In 1926, during his second tenure of the Fastest Man on Earth title, Parry Thomas drove a T.T.

The T.T. Vauxhall against a typical English hillclimb background of the early twenties. The driver is Humphrey Cook, who later fathered and financed the E.R.A. venture.

1922 Vauxhall with the advanced dual-overhead-cam engine designed by Sir Harry Ricardo. Three of these remarkable cars were built to conform to a formula that never was.

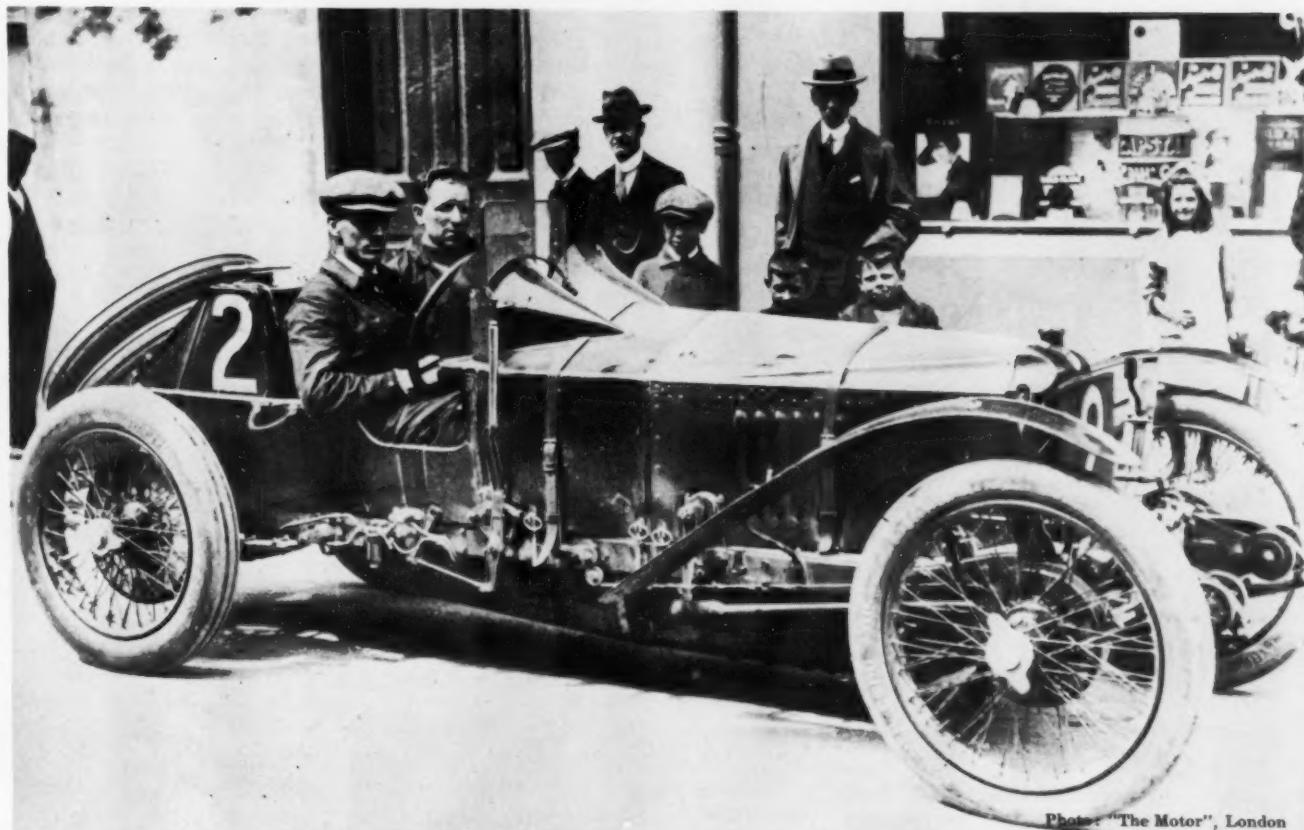
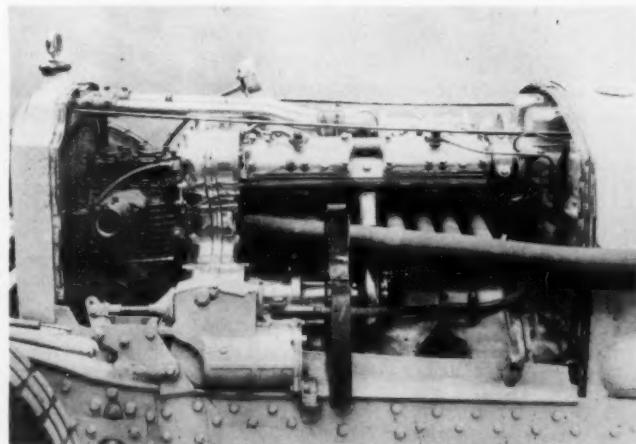
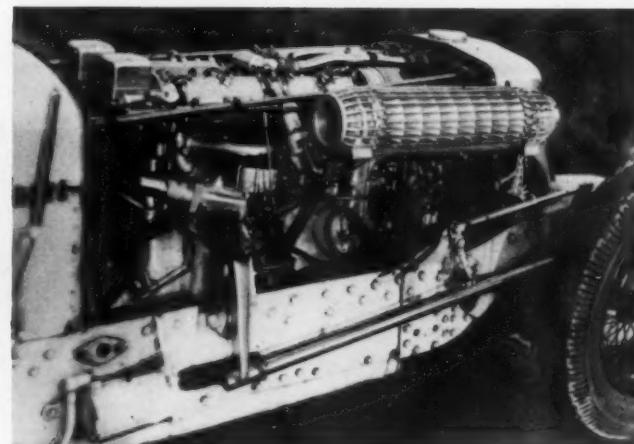


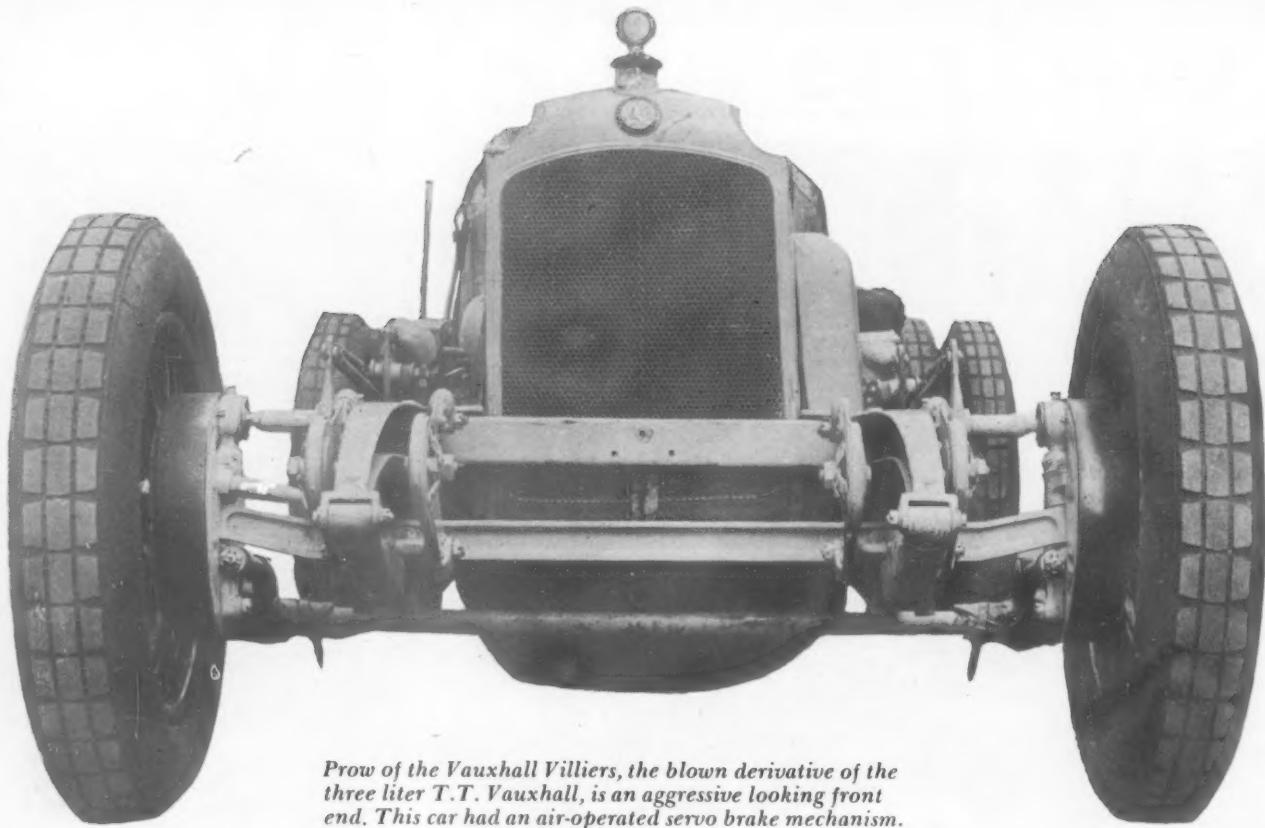
Photo: "The Motor", London



The first of two stages of boosting and super-charging gave this Vauxhall Villiers an output of 250 hp from 3 liters over 25 years ago.



As finally developed, the Villiers Supercharge (with intercooler) produced 300 hp at 6000 rpm, an increase of 132% over the unblown original.



Prow of the Vauxhall Villiers, the blown derivative of the three liter T.T. Vauxhall, is an aggressive looking front end. This car had an air-operated servo brake mechanism.

Vauxhall for one hour at 104.88 mph during a wholesale cleanup of international class D records. At Shelsley Walsh, the classic English hillclimb, Raymond Mays beat the field five times in five years on his supercharged derivative of the same model. The Mays car, incidentally, after passing through numerous incumbencies and undergoing serial makeovers, is still waging lusty war in British sprints, thirty-five years after Sir Harry Ricardo and his chassis-design collaborator, C. E. King, put the fruits of their combined genius onto the drawing board.

To fill in readers who didn't catch *SCI's* July issue, and therefore missed Karl Ludvigsen's awed appraisal of Ricardo's *tour de force*, let's take a second look at the masterpiece he sold to Vauxhall for their T.T. bid in '22. This truly remarkable engine had four wet-lined cylinders with a bore and stroke of 85 by 132 millimeters, an aluminum alloy block, two separate bronze cylinder heads (one to each neighbored pair of pots), a buildup crankshaft to accommodate the six ball-bearing mains, roller big ends, a central flywheel, two overhead camshafts driven by a frontal train of spur wheels, four valves per cylinder and provision for three spark plugs in each head. In practice, though, only one plug per cylinder was fitted, with central location. Contrary to general racing usage at that time, ignition was by coil and battery. (Unlike, Duesenberg, whose contemporary racing mills also employed coils rather than magnetos, Ricardo dispensed with a generator).

The valves, operated through non-adjustable fingers, made an included angle of 90 degrees, and all eight exhaust ports were separate. On carburetion, as in so many other departments, Sir Harry's thinking was way ahead of his time: from each barrel of a dual choke Zenith carb, one tract nourished a duet of cylinders, there being no connection between the two systems. Over on the exhaust side, Y-junctions cored in

the head collected the spent gas for discharge through four downpipes.

Stuck with the low octane fuel that was available at that date in those latitudes, Ricardo set his compression ratio at the puffball figure of 5.8 to 1. In spite of this, though, his plant developed 129 horsepower at 4500 rpm, which, as Ludvigsen has pointed out, represented 0.72 bhp per cubic inch. Actually, however, the merit of the achievement is best measured by the yardstick of power relative to piston area, in which light it much more closely approaches modern levels for unblown racing engines. Each square inch of piston crown yielded a phenomenal 3.67 horsepower.

Notwithstanding the large crank chamber capacity imposed by the indoor flywheel, the whole structure was enormously rigid, a factor contributing importantly to the high mechanical efficiency that was realized—80% at 3000 rpm.

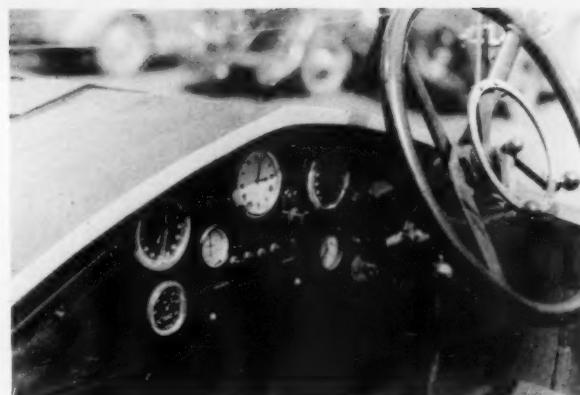
Fitted with the original two seater body—deckhands were compulsory under the T.T. rules of the day—this 3 litre Vauxhall had a top speed of around 115 mph. Obedient to the destiny that seemed to ordain that Vauxhall's race projects should fail before they succeeded, the car flubbed its solitary T.T. strike. Out of the three machines that were fielded, one placed third, behind a Sunbeam and a Bentley, and at least one of the other two retired with minor engine derangements. Actually, though, in spite of their immaturity, the Vauxhalls were considerably faster than the victorious Sunbeam, this being demonstrated beyond doubt when one of the Sir Harrywagens beat a T.T. 'Beam by 5 mph in a straight fight at Brooklands later the same year.

Although the performance of the T.T. engine, right off the drawing board, was already high by the standards of its time, Ricardo, with a foresight and imagination that bore the mark of the mastermind, endowed his fledgling with tremendous margins for long-term development. For instance the power-

plant of Raymond Mays' hillclimb car, variously designated the Vauxhall-Villiers and the Villiers-Supercharge, was finally made to develop 300 bhp at 6000 rpm, going up in gradual stages over a period of the six years ending 1933. Major ingredient in this home-cooking exercise was an Amherst Villiers blower giving a maximum boost of 20 psi and fed through triple Zenith carburetors. Ricardo himself—and Vauxhall themselves—took no part in the several makeovers, which were the result of teamwork between Amherst Villiers (who also did much of the development on the historic Blower Bentleys for Le Mans), Tom Murray Jamieson (who was later to design the two-ohc Austin Seven engine), and Peter Berthon (subsequently the guiding technical intellect of the E.R.A. and B.R.M. ventures).

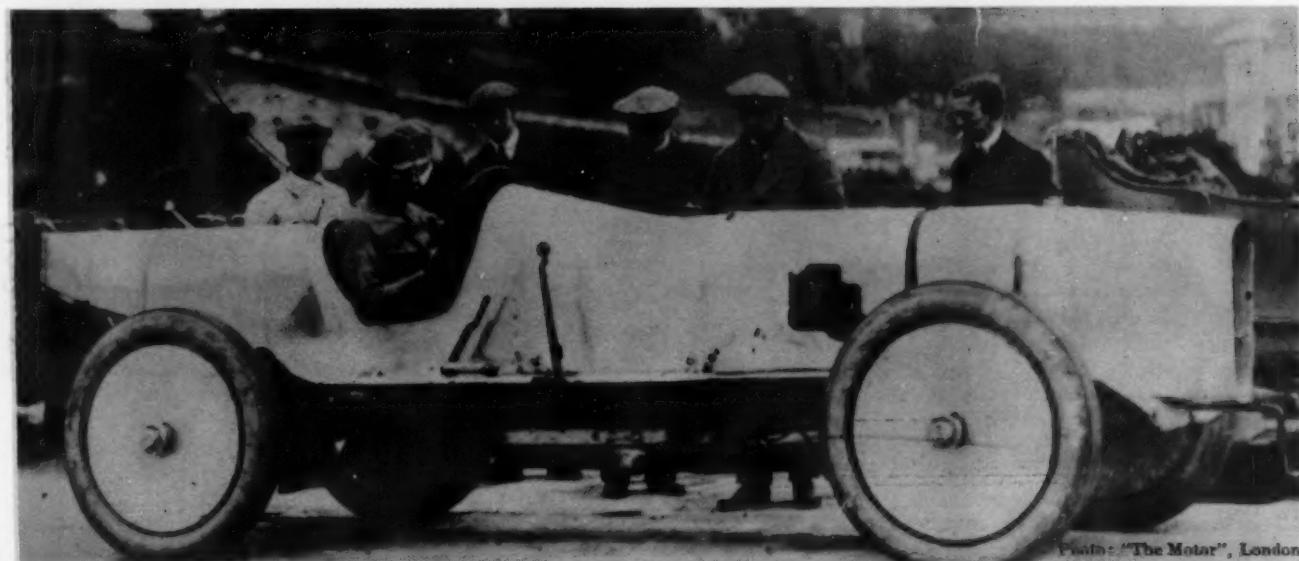
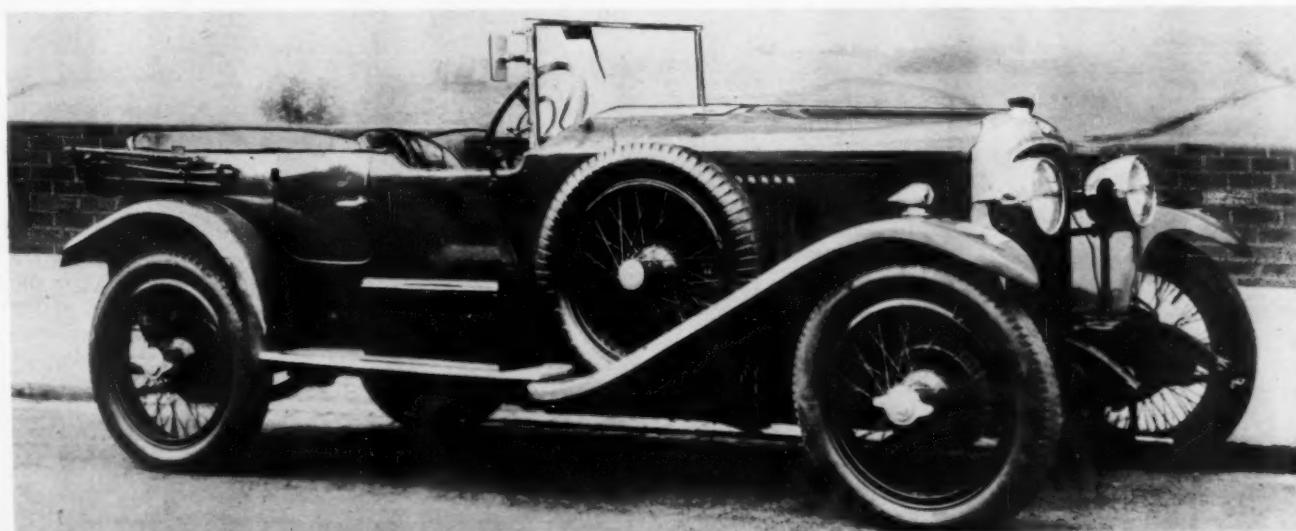
With its relatively-heavy reciprocating parts and a piston velocity of 5189 feet per minute at peak power, this supercharged frigatooon had an understandable reluctance to hold onto its top notes for very long. Once, when Mays was rash enough to keep his foot in the Zeniths for a complete lap during Brooklands tryouts, the entire car was seized with what he later described as "mechanical palsy." For agonizing moments, during which the car was within inches of going over the top of the banking, the eyeballs of the terrified fellow travelers—Mays and Berthon—were shaken around in their sockets so violently that they blacked clean out. On

(Continued on page 61)



Typical 30/98 dash layout, with vertical mahogany instrument panel and easily-read dials. Steering wheel, with timing and throttle controls, is dished.

BELOW, TOP: 1924 OE-type Vauxhall, ohv version of 30/98, with classic sports-tourer body. Earlier examples had L-heads and rear-wheel brakes only. **BELOW, BOTTOM:** Vauxhall pioneered the razor-blade shape at Brooklands before WWI. This car, driven by A. J. Hancock, smashed seventeen records.



Printed: "The Motor", London

Riverside:



California Spawns a Speedway

by Jim Mourning

WHILE A MAJORITY of Southern California residents concentrated on the *Confidential* trial, the problem of adequate water or the somewhat comic attempts to capture the Brooklyn Bums for Los Angeles, the area took a long step toward becoming one of the major racing centers of the world. On September 21, the \$800,000 Riverside International Motor Raceway held its first event, a road race sponsored by the California Sports Car Club.

The possibility of a major racing plant in California had been an often vocalized dream during the past two years, but the event still found more than one alleged authority hurriedly trying to remove the egg from his face. The fault wasn't entirely theirs. Like the boy who shouted wolf once too often, various promoters had hardened the public to claims for super raceways. Asserted sponsors and would-be sponsors of dream circuits from San Francisco to San Diego had continually restricted themselves to vocal efforts, become bogged down in delays or found themselves enmeshed in red tape. As a result, a large segment of the public merely arched an eyebrow whenever the topic popped up.

Through it all, however, one man persisted. He was Rudy Cleye, a restaurateur and active competitor with a successful record in both American and European events. After one false start, several detours and enough delays to produce a magnificent set of ulcers in a lesser man, Cleye finally got the Riverside venture off the ground. When financial anemia caused it to falter, a transfusion was supplied by sportsman and racing enthusiast John Edgar, who is now listed as the sole financial backer. To complete the line-up of enthusiasts, E. Forbes Robinson, the Australian-bred sports car and midget driver, was appointed general manager and the contract for building the raceway went to Jim Peterson, a top local Jaguar pilot and president of the National Sports Car Driver's Association.

Actually, the Riverside layout, some 60 miles from Los Angeles by freeway, is a multi-purpose affair. Blueprints call

for road racing circuits of 5, 4.3, 3.2, 2.5 and 1.7 miles in addition to a mile oval and both half- and quarter-mile drag strips on the 1.1-mile straight. Although construction was not completed at the same time of the CSCC event, the facilities included all paving, all perimeter fencing, underpasses, a permanent office building containing a two-bed emergency hospital and adequate albeit dusty parking accommodations for 20,000 cars. Paving of the parking area began the week after the event and the surrounding terrain has been seeded in an effort to whip the dust problem that cropped up when the winds rose in the late afternoons on both days of the event.

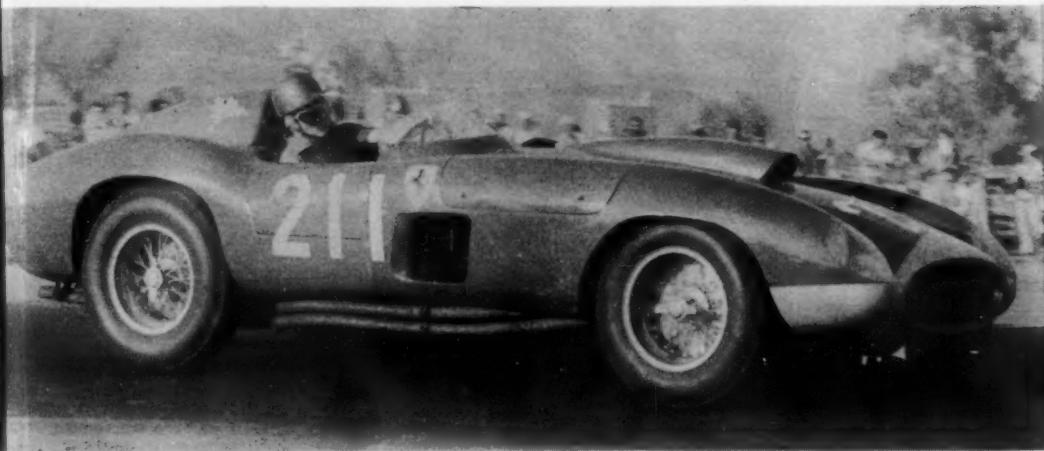
Plunked down in 528 acres of rolling hills, the various road racing lay-outs are among the most visually dramatic in the country today. In many instances, the road, which ranges from 35 to 60 feet in width, slashes straight through rather than following the contours of the landscape. A good portion of the long straight, for example, runs between two towering walls of earth, which provide spectators with a unique view of the tops of competitors' heads as they whip past at 130-150 mph.

But whatever else the raceway is, it isn't something for the casual competitor. At least, not that portion of the track utilized for the inaugural event. Whether by accident or design, the lay-out contains nearly every nasty feature to be found in road racing circuits anywhere, including dips, changes in camber, decreasing radius turns and a banked turn—sans escape route—on the end of the long straightaway.

Even though no one really doubted the trickiness of the course or the sincerity of club officials when they practically begged for caution, the week-end record showed one casualty, one case still in doubt, one severely injured driver and a lot of badly bent machinery. The casualty came during a blistering battle for first place in Sunday's opening event, when John Lawrence, noted and well-liked automotive body

(Continued on page 64)

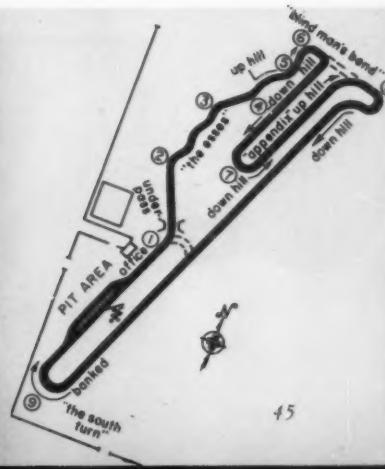
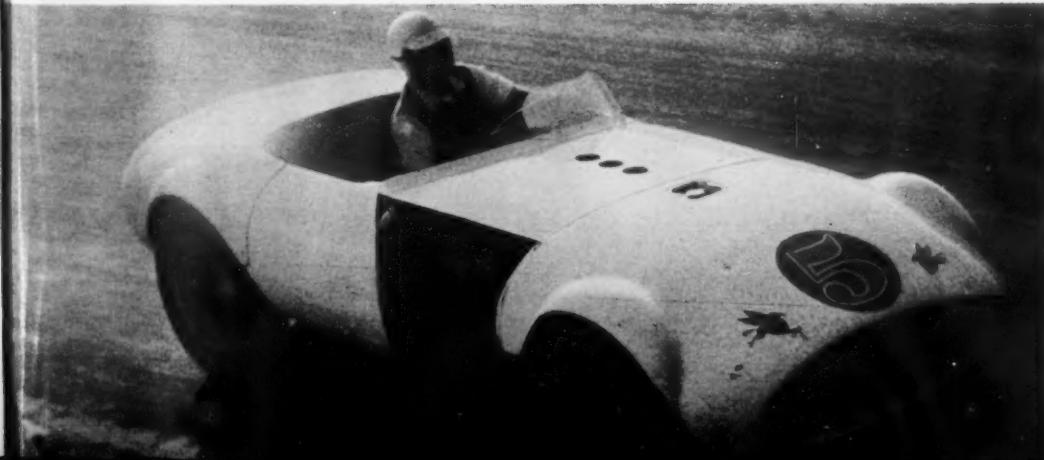
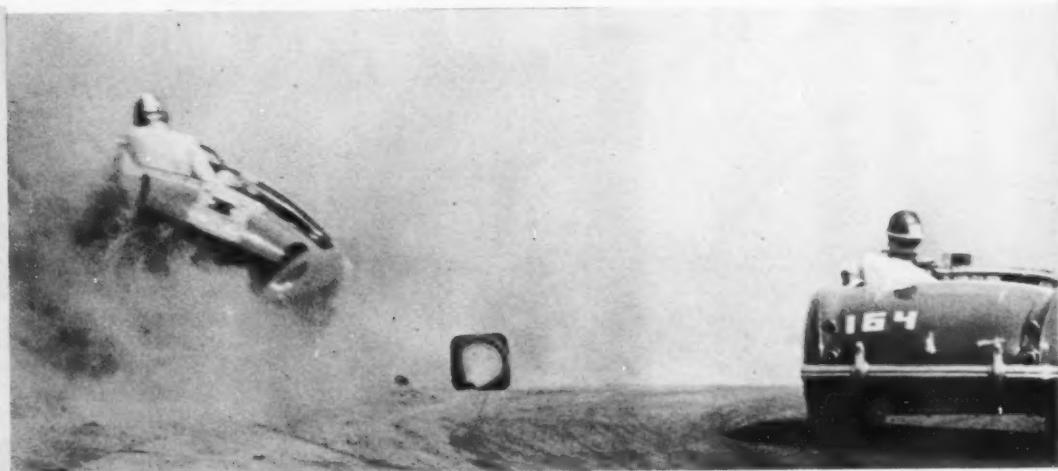
Fifteen year-old Ricardo Rodriguez flew from Mexico City to drive an RS Porsche. Not mentioned in the pre-race publicity, Ricardo, who was a motorcycle racing champion at 12, displayed remarkable ability. He outmaneuvered veteran Bob Drake on the last turn and flashed ahead of the Cooper Climax on Saturday.



Photos by Bob Rolofson

Richie Ginther, local Ferrari representative, won the main event in a Edgar's 4.9 Ferrari. Toward the end of race, Bob Drake was leading in Frank Arciero's 4.9 Ferrari, but he spun out in the esses, handing the lead and race to Ginther, who didn't know he'd won 'til after the race was all over.

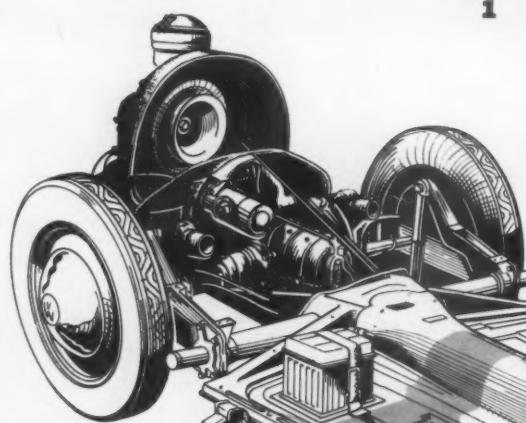
RIGHT: one car tried the over-the-embankment route on turn # 6. Miraculously he didn't turn the car over.
BELOW: Chuck Daigh, in the Troutman-Barnes Special whips through a corner. Car's acceleration was fantastic, but the brakes left a lot to be desired against the imports.



SCI

HOW-TO

FEATURE



BODY FOR A BEETLE

VW - Devin PART I

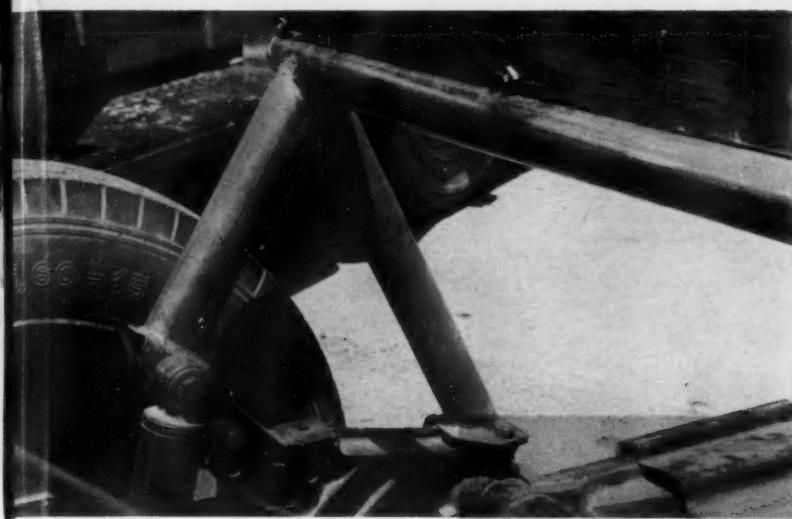
by Bob Behme

Devin offers two bodies for the VW; the one which Buckland used is the more suitable for competition but it requires a 10 in reduction in wheelbase. The other body drops right on the VW frame and is just the thing for a "street" machine. Buckland found that the best way to shorten the VW chassis is by torching or sawing across the floor at 13 and 23 inches ahead of the rear bracket, and through the tunnel at 12½ and 22½ inches. The half-inch off-set there is to avoid cutting the heater knob support. On some VWs, this will not be necessary. At the outer edge of the floor, cut a triangular piece as shown in the cutaway before sectioning the floor, refitting it later to give a smooth floor and an even outside edge. Cut off the jacking bracket if you wish. Remove all cables from their conduits within the tunnel before cutting. Disconnect fittings at outside of tunnel and pull the cables through. Break conduits away from the tunnel and its rearward extensions. After tunnel has been welded back together, the conduits are replaced. If desired, they too may be cut ten inches so their end fittings go back in the same place, but if this is done, the cables must also be shortened the same amount.

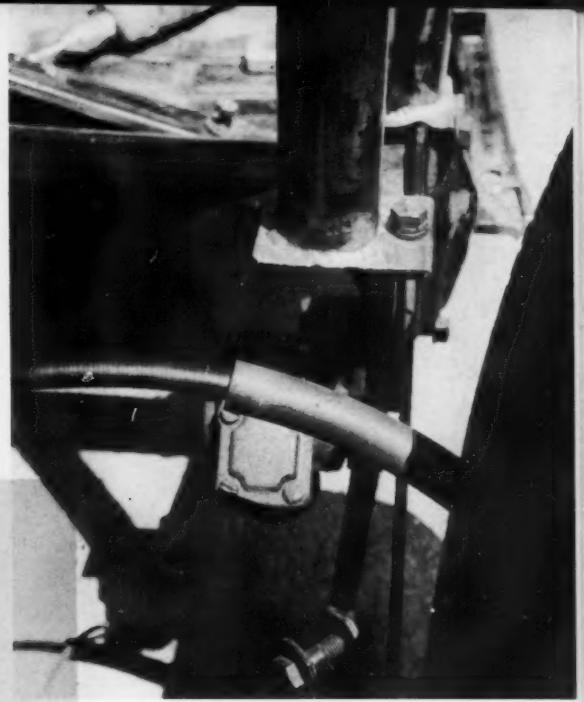


Roll bars front and rear are basis of supplementary frame and body supports. They are made of 1½ inch tubing, front one is 18 in high and 42 in wide, rear one is only 15½ in high. Check these measurements by placing plastic body on the chassis and measuring clearances.

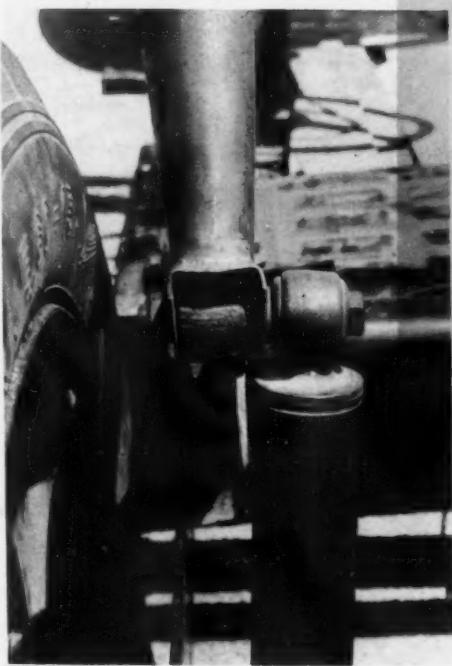




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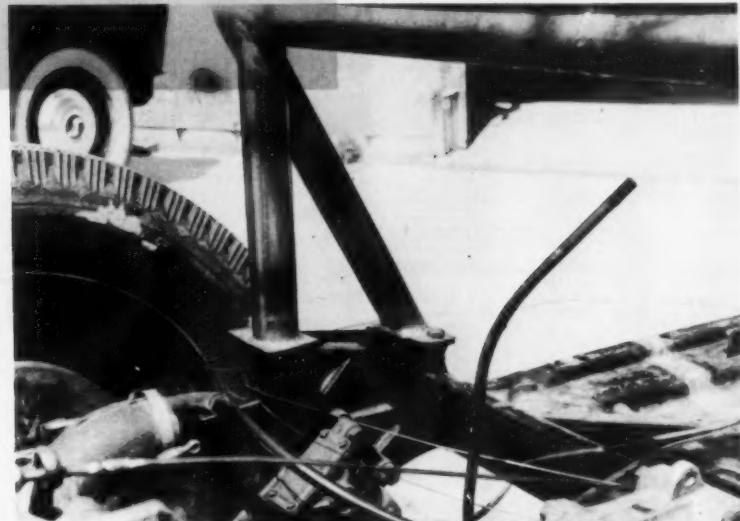
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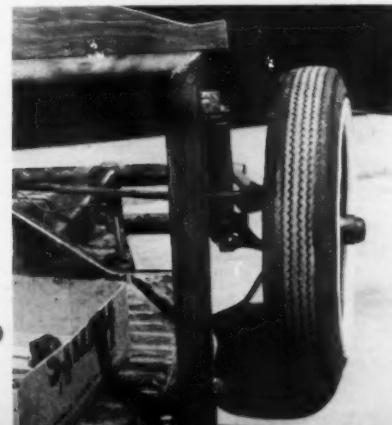
Three inch square "feet" of 18 gauge steel were made to attach the forward support of the rear roll bar directly to body attachment holes by the torsion bar bracket.



8



Front roll bar sits on channel shaped outrigger welded to the frame near the front end of the seat slides. Use 90° welded joints and straight sections of tubing with a wooden former cut to match the body contour. Optionally, use electrical conduit bent to shape instead of wood.



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The Jordan Special

The Grand Prix of Germany



The 300 SL Roadster

A rare combination: outstanding road performance plus luxury

The new 300 SL Roadster bears a very close design kinship to the highly successful 300 SLR competition sports car and the 2.5 liter W 196 Mercedes-Benz Grand Prix car. The addition of compensating springs on the 300 SL's single joint rear swing axle results in handling and cornering characteristics of a very high order. Proper use of power and steering will take the 300 SL Roadster through difficult corners at high competition speeds. The space frame is redesigned to accommodate conventional doors, and flexibility of the 250 hp fuel injection engine is such that

smooth acceleration from 15 mph in top gear to maximum speed is easily achieved. Actual overall performance of the 300 SL Roadster is what you would expect: *Outstanding!*

However, what you would not ordinarily expect in a car of such high performance are the luxurious seats and appointments you find in the 300 SL Roadster. Roll-up windows and a snug, truly all-weather top that goes up in seconds, extremely comfortable leather bucket seats and a redesigned instrument nacelle for instant reading are some of the features.

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Studebaker-Packard
CORPORATION

Fangio and Nuvolari

(Continued from page 17)

point system, a total of 64. A little more than half that many would have been enough to win this year; but on the other hand Fangio has won eight races this year, not six. In 1933 Nuvolari was first ten times, and his wins that year included both Le Mans and the Mille Miglia. His life-time record shows only 16 seconds, 9 thirds. As a rule, he either won or broke up the car. Here again he is at the opposite pole from Fangio, who was almost never forced out of a race by over-stressed machinery. Fangio, who began life as a mechanic, has an uncanny perception of the strain an engine will accept, and no one since Rudi Caracciola has been easier on his mounts.

Fangio has run in 95 G. P. races and won 41 of them. He has placed second 20 times and 3rd twice. Nuvolari's record is 172 races, 64 wins. Again, the comparison is not altogether valid because when Nuvolari, after a period of bicycle and motorcycle racing, entered his first car race on May 22nd, 1921, it was the Circuito del Garda, an established road-course. Fangio's early races were hairy, hell-for-leather things in the Argentine hot-rod category, *Mecanica National*, mechanics' races run in home-assembled *bolides*, most of which were unsanitary in the extreme. Fangio ran "specials" powered by everything but trained mice. He even had a Rickenbacker going for him at one time. But the *Mecanica National* races, if they were primitive affairs by European standards, made brutally efficient training events, and Fangio's great feeling for machinery undoubtedly came from the necessity of holding a tired Chevrolet together over hundreds of miles of dusty pampas and switch-back mountain roads. He ran in 32 of these races. He won his first *Mecanica National* race in 1940, a Buenos Aires-Lima-Buenos Aires go-round (distance 5932 miles) in a Chevrolet. After that, it was the old story: he began to be offered the wheel on good cars, and when the Argentine government sent a team abroad for the 1949 season Fangio won six out of ten events. Two years later he was champion of the world. He has competed now for 21 years; Nuvolari drove his last race in 1950, 29 years after the first.

There seems small point in carrying the factual comparison much farther than that, although it could be done. Perhaps if we fed into an IBM machine the total number of miles each driver ran in his competitive life-time, setting Nuvolari's motorcycle races against Fangio's *Mecanica National* events, added the average speeds weighted for barometric pressure and track temperature, plus Pomeroy's Formula for annual increase, with cc. of engine capacity with allowance for blowing, we might arrive at a more nearly exact analysis. But in fact the intangibles are more interesting.

Both were kind, gentle, considerate men off the circuit. S. C. Davis of *The Autocar* said of Nuvolari, "I think that the thing we shall remember most of that gallant little man will be his essential friendliness

. . . there was something about him that attracted one immediately." Even Achille Varzi, Nuvolari's bitterest rival, always referred to Nuvolari in his absence as "Il Maestro." Legend to the contrary, Nuvolari was not a rough or dirty competitor. He would not give an inch of his ground to his best friend, but he wouldn't take what wasn't his, either. He knew the rules, though, and he beat Varzi out of a Mille Miglia, one of the three times he won that race, by driving flatout for 50 miles without a light showing, until he had come up to Varzi, who was stroking, a sure winner, then switching on and passing him. As for Fangio he is very probably the best-liked G.P. driver of our time. Mild, calm, amused and amusing, he has no enemies in his profession and I at least have never heard a harsh word said about him. And—here again the difference—he maintains this demeanor on the circuit to a greater extent than Nuvolari ever did. Nuvolari, with his foot in it, was pretty much all business. He usually left the social amenities in his pit. Drivers running into a corner with the great Mantuan did not expect to be waved ahead, and they weren't; if they cut him off, inadvertently or otherwise, they knew they would be informed of his displeasure promptly via an extensive pantomimic vocabulary. Fangio is more than polite, he is courtly. He never forgets a favor or a kindness granted him by another driver, and to be sure that the fellow has noted his gesture of appreciation, he is likely to repeat it the next time he laps him. He knows where his friends are on the circuit, and he lets them see that he knows. Last year, at Sebring, Diana Bartley walked around the whole 5.2-mile circuit to make photographs. Fangio kept track of her progress and waved to her on every lap.

Considerable nonsense has been retailed down the years by writers discoursing on drivers' varying "styles." It is amusing to see photographs of three drivers placed side-by-side under a sober caption urging the reader to note the difference in style. Usually the differences are so minute as to be nearly invisible: perhaps one driver's elbow is bent at ten degrees to 15 for his colleague, and that's about it. However, a valid comparison is possible between Fangio and Nuvolari. Fangio sits as relaxed as a plate of *pasta*, every muscle apparently limp. He has his back well into the upholstery, his arms nearly straight out in a modification of the manner first used by Dr. Farina and carried to its extreme by Stirling Moss. He indulges in no dramatics. If he wants to check the condition of the rear tires, he does not do it in front of the main grandstand at 160 miles per hour. He looks straight ahead. Except in the mad rush for the first corner after the start, you somehow do not often see Fangio in an elbow-to-elbow dust-up with other drivers.

Nuvolari was a dramatist, and he played the role of racing driver to the hilt. He sat straight up, his shoulders often not touching the seat-back at all, his body close to the wheel, his elbows bent. He bounced in the seat. He shouted, he smiled at other drivers, or glared at them in anger, or looked through them in haughty indifference. Sometimes, flying down a straight with the gas-pedal flattened on the floor, he would bark back to his coun-

try boyhood and beat on the side of the car as if it were a laggard horse. He threw himself from side to side in the cockpit. He seemed to use the wheel more than other drivers of his day, moved it oftener and through greater arcs, perhaps because his attack in corners was so radical, his drifts more frequent and sharper than others. Nuvolari's style was original with him, and came about, he said, because he found that at 135 pounds he did not have sufficient strength to horse the big cars of the time around. He found it simpler to let them follow the course they wanted to take, that is, to drift out, and to control them with throttle and steering adjustments, guided by his incredible sense of balance. Some authorities have credited Nuvolari with originating the four-wheel drift. Undoubtedly it had been used before him; but just as surely Nuvolari did develop and perfect it as a cornering technique and thereby he profoundly influenced every driver who came after him.

Nuvolari drove on the roads with almost as much dash as he used on the circuits. He drove fast, and if he had an interested passenger, he might deliver an illustrated lecture on the subject of drifting, or the use of bumps and ridges in the roadway. These lectures could be very stimulating, even if delivered in something no hairier than a Fiat *Topolino*, and his passengers were apt to remember them.

A recent LIFE profile depicted Fangio as a veritable model driver who meticulously obeys every rule in the book, and particularly never breaks the speed limit. It's true that he is not really a wild man on the road, but, like Nuvolari and nearly all big-time drivers, he usually does hurry. A month or so after the LIFE piece appeared, Fangio figured in a little incident in Italy: hitting the brow of a blind hill at 8 o'clock one night, reading 120 mph in a Lancia sedan, he found a truck across the road 70 yards ahead. Being the incredibly skilled driver he is, he got himself and his two passengers out of the scrape in one piece, despite his 120 mph rate of travel. Another time, a few years ago, he came around a corner at about 85 to find two cars abreast on the road. He took to the fields, went around a big tree and came back on the road, never, of course, having touched the brake. A ride with Fangio is stimulating, too—as an example of intelligence applied to the business of staying alive. Actually Fangio does not care for road-driving. He loathed the Mille Miglia, and although he finished second the year Moss won, he refused to run in it at all last year. His reason, cited by Portago, was widely quoted: "No one with a conscience can run fast in the Mille Miglia." He doesn't like driving at night, and refused to do so in last year's Le Mans. This was probably wise. Fangio has superb vision, but at 46 his accommodation to light and dark simply cannot be of the best, and only men with superior night vision have any right to run around the clock at Le Mans.

Fangio is an old pilot and he can be a bold pilot when he feels it's warranted, as when he broke up a car at Monaco, bouncing it off telephone poles and building corners trying to catch Stirling Moss, but for the most part he abhors risk and wants the percentage on his side. Nuvolari would accept ridiculous hazards—and he had the scars to prove it. He was said to

(Continued on page 52)

A special Pre-Publication Offer to readers of **SPORTS CARS ILLUSTRATED**



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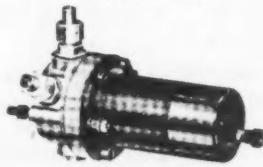
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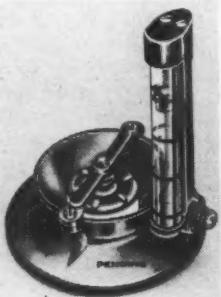
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Fangio and Nuvolari

(Continued from page 50)

have broken every bone in his body at least once and 17 times hospital bulletins listed him as "serious" or "critical." (The 18th time, it stuck.) Fangio has been badly hurt only once: He flipped a Maserati at Monza in 1952, severely injuring his back. He refused to run in the abortive "500" race at Monza last summer, on the ground that it was too dangerous, a stand in which he was joined by most of the European G.P. drivers. It was just plainly a bad business proposition.

Fangio has won every important G.P. circuit race in the world at least once, and he would like to run at Indianapolis before he retires. Winning it would not add much to his stature, but even so it is the only big one the Old Man has never run in, and if a suitable car were offered him he would take the ride. Nuvolari did run in a *monoposto* G.P. event in America, the Vanderbilt Cup of 1936, which he won, blowing off the likes of Wilbur Shaw and Mauri Rose, who, to be fair, were pushing equipment entirely unsuited to the job at hand.

Mere money can no longer tempt Fangio. He is at least once a millionaire. Nuvolari, too, was well-off when he died, although not as wealthy as the Argentinian. Both have been careful spenders and good bookkeepers, living as they drove, looking ahead. Fangio has never driven on a G.P. circuit that he did not know as well as he knew his own driveway at home, and Nuvolari, in practice, could often be seen trying the shoulder at full bore, to find out what it would be like to be forced off. In competition he often seemed to be driving as if he didn't know what was around the next corner and didn't care, but if there was a stone as big as a hen's egg sticking out of the tar anywhere on the circuit Nuvolari knew about it.

The longer one pursues the matter the harder it is to decide whether one of these men was abler than the other. Both have been conceded to be kindly, quiet beings in whom a competitive urge amounting almost to a killer-instinct burned hot. Mike Hawthorn and Peter Collins are as tough as drivers come today, but when Fangio moved out to take them at the Nürburgring they were taken and they stayed taken. Nuvolari once told a rival, "I can beat you on anything, including bicycles." They borrowed bikes and adjourned to Monza. Nuvolari won.

Fangio has won more races on percentage, but he did not have the unearthly ability to beat faster cars that Nuvolari knew, as at the Nürburgring and in the 1947 Mille Miglia, when he placed 2nd overall, and very nearly won, in an 1,100 cc. *Cisitalia*. Fangio has compressed his career into a shorter span, but Nuvolari's dedication was deeper: he raced until he was so sick and so old that he had to be lifted out of the cars.

Overall, today, I think Nuvolari remains what everyone has called him for 20 years: the greatest racing driver who ever lived, and Fangio stands next, and very close to him. But if Juan Manuel Fangio too should compete in everything open to him until his 57th birthday...!

—Ken W. Purdy

Ferrari 250 GT

(Continued from page 21)

The 250's cornering ability is all that you might expect. It may not equal the outright competition Ferraris in this respect, but this is deliberate. Ferrari has proved that he can build cars that handle fantastically well right up to the limit of adhesion—but this is too late for the driver of average skill. The 250 GT is designed for the average good driver and it allows him very high cornering speeds while still limiting him to a range where he's not likely to find corrective maneuvers impossible. The 250 is no tricky thoroughbred that challenges you to figure it out the hard way. Its cornering limits are high and they come in gradual, friendly fashion.

If you're hard on it in a tight, slow bend the front end pushes out very gradually. Most of the time you can just leave your foot on the throttle and grab more wheel to pull the car around. If the front plows too much you have plenty of time to back off on the throttle. In a fast, sweeping bend the rear end will begin to hang out very slowly as speed increases. You balance steering against throttle opening and the car follows the arc in a completely satisfying way. If the rear starts to go too far you back off—but again you've had plenty of warning, and the rear comes right back in line.

As far as racing is concerned the GT's only shortcoming is that a limited-slip differential is not a standard feature. The "inside" wheel doesn't lift during full-power cornering, but it does break traction and spin.

The 250's brakes are gigantic for a car of its weight. Each of the eight linings measures 2.50 x 16.25 inches, giving a total friction area of 325 square inches. Thus our test car, in spite of its considerable weight of 2880 lbs., had a brake lining area per ton figure of 226 square inches. Many big Detroit cars have less than 100.

The massive lining area is abetted by light alloy shoes and Alfin drums, plus a hydraulic booster on the front brakes. All we can say about these brakes is that they're perfect. Pedal effort required is light, fade is nil; pulling to the side, chattering and squeaking are non-existent. It wasn't until the eighth stop of the ten-stop fade test that a very slight odor of hot lining became apparent.

The styling theme of the 250 coupe might be called contemporary Italian conservative. It's beautiful without being the least bit gaudy and its Americanesque touches are handled with taste. These include the Farina-Nash type of rear roof arch (the C-pillar in Detroit jargon) and the GM-flavored rear deck treatment that makes for optimum cargo space. The package is worthy of its contents.

The engine compartment is immaculate, not only in terms of the clean finish of all the mechanical components but also in terms of neatness, lack of clutter, eco-



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(Continued on page 54)

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Ferrari 250 GT

(Continued from page 53)

nomical utilization of available space, and detailing of individual parts. The fuel piping, for example, is a splendid thing to contemplate, with its armored flexible sections, chrome-plated manifolds and finely machined fittings. The engine's water piping is just as admirable. Its carefully welded, cad-plated graduated-bore manifolding speaks eloquently of thoughtful planning, painstaking workmanship and high standards of quality.

The engine is the familiar Ferrari V-12 and follows the custom of the house in taking its name from the displacement of an individual cylinder: 250 cc. The crankcase-block, heads and cam covers are light alloy castings. Wet cylinder liners carry four-ring pistons on short, side-by-side, H-section con rods. The crankshaft rides in seven Thinwall bearings and drives the cams, water pump and generator by means of a silent chain. The cams ride against rollers in rocker arms which actuate two screw-adjustable valves per cylinder, working against hairpin springs. The chain-driven generator lies directly above the nose of the crankshaft and drives the radiator fan by means of a belt. Carburetion is by three dual-throat Weber downdrafts and ignition is by 12 volt battery with one distributor and coil per bank of cylinders.

Each car is delivered with a set of 22 tools including a lead mallet for the wheel hubs, a hub puller and a jet wrench. Also included is a very large owner's manual including detailed overhaul instructions and a spare parts catalog in which each part of the chassis, down to the least cotter pin, is pictured and labelled. Ferrari's attention to detail in the presentation of this product is up to the best German standards—and that's good.

Distribution facilities for Ferrari production cars have reached a new high of quality, efficiency and competence. Luigi Chinetti has for years been the factory's official U.S. representative in New York, but Ferrari has had no corresponding outlet on the west coast—a market at least as avid as the east. But when Richie Ginther left for Le Mans in '57 to drive for the Ferrari factory team he spent three weeks in New York negotiating with Chinetti for factory-representative status in California. These preliminary talks were firmed with factory men at Le Mans and Ginther returned with his goal achieved. His agency in Hollywood has a large stock of the latest 250's on the floor for immediate delivery, plus a good selection of new and used Ferrari competition machines. Ginther's operation is well-financed and is founded on the conviction that a car can only be as desirable as the parts and service that back it up. Between Chinetti and Ginther and the factory's alacrity with air express shipments, the main deterrent to Ferrari ownership—service—has been removed.

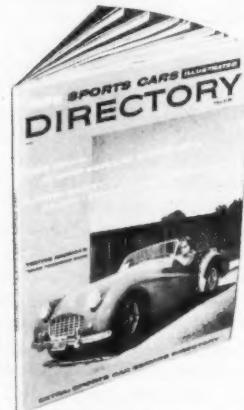
—Griff Borgeson

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Denzel 1300

(Continued from page 31)

the sporting driver what he considers tops in a high-performance small-displacement automobile.

The WD is far from spartan in interior appointments, too, with a padded dash above an array of instruments including the usual generator and oil pressure warning lights, oil temp gage, tach and speedo of the Porsche Speedster, plus a fuel gage and a clock. Generous pedals cap the clutch, brake and throttle and a stout chromed shift-stick rises out of the floor just ahead of a manual spark lever and adjacent to the handbrake. The seats are framed in chromed tubing and not at all bucket-like. They are broken $1\frac{1}{2}$ so that the passenger space may be occupied by an adult and one child, or two small adults. Excellent quality upholstery material, a skillful ersatz leather, covers foam rubber cushions. There is no rear seating at all, the space is decked over and used for top stowage.

The top is the kind that comes apart (like the TR) but is fairly easy to erect. The chromed bows are sturdy and precisely made and an intelligent tensioning strap is designed to prevent top-flapping at speed (Porsche: please note). With the top up, there is baggage space behind the seats sufficient for anyone accustomed to touring in a sports car. A touring radius of 456 miles is promised on one filling of the 13.5 gallon aluminum tank which occupies the nose section . . . meaning 34 m.p.g.

Meanwhile, back at the laboratory, our Schlipsticken und Measuren Gruppe has been hard at work sifting the inches out of the millimeters, and we arrive with some dimensions: wheelbase, 82 in.; tread, 52 in.; body height, 34 in.; maximum height, 47.5 in.; maximum width, 64.5 in.; overall length, 141 in. and ground clearance, 7 in. This all adds up to a compact machine which, as we listened to the healthy blat of exhaust issuing from an almost non-existent muffler, promised to dig in and go.

The hard note of the exhaust is not deceiving. When you depress the forward button its high compression bark mingles with a scream from the oil cooler and the lovely sound of air being sucked into those big Webers. The effect is instantaneous, too. Acceleration is sufficient to keep you from getting run over before you get into turn one.

Rather than run half-hearted tests on a city street with a passenger and stopwatch-speedo timing, Hannig & Olbrich accompanied us to an electrically-timed dragstrip where we spent a half day in runs against the clock. With a new engine, an arbitrary upper limit of about 5,500 rpm was set, and we proceeded from there. These acceleration trials were more interesting than usual because of the crash box and the necessity of abandoning the speed-shift technique ordinarily employed. The feel of the transmission is firm and positive

(Continued on page 56)

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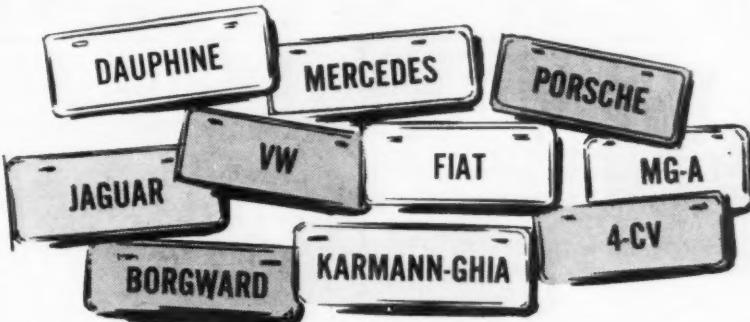
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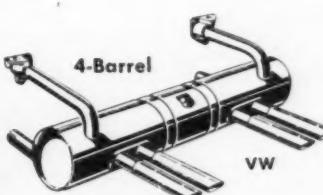
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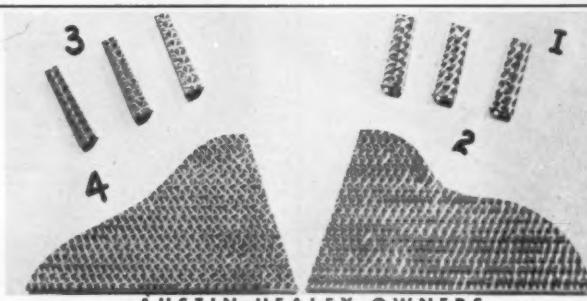
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Denzel 1300

(Continued from page 55)

with a short, precise motion of the lever making it easier than expected. It is significant that each succeeding run was quicker, indicating that a greater familiarity with the car and a broken-in engine could probably produce better times. Here are the results of four quarter mile standing starts for top speed: 76.85; 77.12; 77.18; 77.78. Shortest elapsed time for the quarter was 17.75 seconds.

For comparison here are some times turned in by other sports cars on the same morning under identical conditions:

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During a typical run the car was not feathered off the line on the clutch, but was revved up to about 3000, the clutch eased out just enough to start it rolling, and then dropped at the same time the throttle was depressed to the floor. About 60 ft from the starter, the shift into second was made and a quick windup to 5500 brought the speed to above 50 mph. The rest of the trip was made in 3rd, crossing through the trap at 5600 rpm. At this point the WD felt like it was coming on real strong and, had space permitted, a top of probably 110 in 4th could have been attained.

To check out our impression of the WD's handling and general feel, we asked a couple of West Coast competition drivers to give it a run through our own proving ground (unknowingly provided by the State Highway Dept.) which includes a sharp right-hand second-gear turn neatly cambered the wrong way . . . a configuration not at all flattering to the suspension. Both parties agreed that the small radius turn was meat for the Denzel and that its steering, brakes and response made it a thrill to drive.

Ed Tomerlin, who races a Porsche Speedster and a Devin Panhard, two extremely diverse-handling cars, had this to say:

"This little bomb comes close to being the perfect sports-racing machine for the average participant. As far as I'm concerned, it packs more real racing kick into a smaller package than anything else going. The first thing you think of when you fire up that air cooled, unmuffled, Weber-carbed engine and listen to it crack is 'Porsche Spyder.' Happily, the handling characteristics do much to further the impression. As with the Spyder, the Denzel seems to sit a little farther forward than the Porsche Speedster, with resultant better vision for fender-positioning around haybales, etc. This also seems to give more even weight distribution (again like the Spyder) and less tendency for the rear-end to take over in slides. On one of the test corners, we came in a tad fast and let the car get pretty far sideways. So far, in fact, we made preparations to let it go ahead and loop, holding it as tight as possible to avoid going off the road altogether. One

last attempt at correction on the wheel, however, produced remarkable results: the little Denzel promptly tucked its tail back into position and we were headed the right way again! My analysis would be a slight oversteer up to the point of slide, which allows you to get around corners the quickest way, changing instantly to what must be very close to perfectly neutral steering when a full drift or slide begins.

The crash-box transmission takes some practice, especially after experience with full synchro-mesh set-ups. It's perfectly positive, however, and makes "popping out" impossible once you stick it in gear. The trick is downshifting without noise and it takes a double stab at the clutch and a good sense of timing to get it right.

From a purely personal standpoint, I like the car because of the sensation it gives of having all the vital parts "gathered around you" in a compact unit. I hate cars that must be herded through bends, watching out for all the overhanging portions. The Denzel doesn't give that feeling. It seems to enclose the driver so snugly (in spite of a vast amount of cockpit room) that every part of the car becomes a well-known extension of himself. Short of a Cooper, a Lotus or a Spyder, I don't know any other car that gives a better feel in this respect.

In fact, considering how well our test model went, I have an idea that the Denzel is going to upset quite a few conceptions of how fast a street-sports car can get through the tight ones!"

Ed's well worded essay seems also to be the consensus, and we here are looking forward to the prospects of competition on the race course between the WD and the Alfa Giulietta. It will probably be some time before Denzel ships any great quantities of 1300's abroad but it may well be that its performance will create the same sort of demand which has spelled success for Lotus in this area. In the meantime, the owner of this particular car should be in for a real ball . . . without a single Alp in sight.

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Maserati V-12

(Continued from page 37)

heads are each secured by fourteen more long studs, providing four equally spaced studs around each cylinder. The crankshaft itself is machined all over from a steel forging, being fully counterweighted and carefully balanced. Ironically, every bearing on it is a Vandervell lead-indium bearing, made by the makers and sponsors of the Vanwall.

The big end journals are 1.968 inches (50 mm) in diameter, and run at 0.0024 clearance. The highly-polished connecting rods are short and stubby, made from forged steel with sturdy H-section shanks and using two bolts per cap. Some of the earlier connecting rod designs broke across the bearing web sections. This latest type is far more meaty in cross-section, and has stood up well. At the small end, piston pins are fitted into bronze bushings. A belt-and-suspenders arrangement of circlips and aluminum plugs locks the pins in the pistons.

The pistons are made by Borgo. They weigh 14.5 ounces and run at a skirt-to-wall clearance of 0.004. Optional crown designs give compression ratios of either 12.0 or 12.4 to one. Each piston is fitted with two compression rings and one oil ring.

The oil thrown from the rapidly rotating crankshaft is caught in a shallow, baffled, cast-alloy sump. Two crankcase breather pipes now duct to each side of the engine, as opposed to the right-side-only system of old. According to Maserati engineers, the extra pipe helps minimize frothing, a serious problem at these unusually high revs. The sump bottom cover plate is finned, but not as deeply as in former versions, because frequently the longer fins would scrape the ground before the suspension had bottomed out.

All the various component drives are built into the block. (On the six cylinder engine all drives ran from a deep casting bolted to the block.) These include the oil pressure pump, the scavenging pumps, two centrifugal water pumps, and the fuel pump. All are bolted on to the main casting. The nose of the crank carries two spur gears. The larger, located forward, drives only the oil pressure and scavenging pumps. The smaller gear drives the water pumps, the fuel pump, and a pair of idler gears. These idlers, one going to each head, drive the distributors and camshaft gears.

The dual ignition system is novel but simple, even though a quick look gives a different impression. Two distributors are mounted at the front of the engine, one on each bank. Each distributor has three groups of four low-tension wires each, a grand total of twenty-four. Each one is connected to its own coil, from which a normal high-tension wire leads to a plug. The twenty-four small coils are grouped together under the scuttle and are covered by a wire-mesh grill. This shields them

electrically without interfering with their cooling. A small aircraft-type battery mounted behind the driver provides the low-tension voltage requirements.

You can also see a large portion of the lubricating system. Oil is picked up in two places in the sump and piped externally to the siamesed scavenging pumps, located at the lower right front corner of the engine. As usual, the scavenging pumps' capacity is double that of the pressure pump so that the pressure pump will not empty the oil tank faster than the sump is cleared. These scavenging pumps send the oil through an oil radiator back to the rear mounted five-gallon tank. (The six cylinder cars used double finned tubes and had no oil radiator.) The pressure pump takes oil from this reservoir and pushes it through a full-flow filter on the left side of the engine. From there it crosses the engine into an external gallery that serves as an oil manifold, delivering oil to the main bearings through each web from the right side. All the junctions are made with two-bolt flanges sealed with O-rings. Part of this piping is flexible hose, so that vibration-inspired oil line fractures shall not again frustrate the Maserati hopes for victory as they have on several occasions in the past.

The 3.7 gallon cooling system of the V-12, similar to the system used in the in-line sixes, splits the output from each of the two centrifugal pumps. Some cooling water is directed to the block, but the larger portion is directed to the exhaust valve guides and the valve seats. The water runs through a set of special manifolds down the center of the heads. Another manifold above the intake valves returns the heated water to the radiator.

The radiator, which includes the header tank, is held by two Silentbloc bushings at the bottom. The radiator hose at the top lends support, but it's flexible. Any twist that might rupture the radiator is taken up by this flexible hose.

A great deal of thought was given to the idea of using an aluminum core as it would weigh less than 10 pounds. However, the conventional copper core was finally selected because of the tremendous cost involved with the aluminum type. The copper radiator weighs 33 pounds.

Aluminum, however, is the material used for the camshaft bearings. Rotating in four extremely-wide bearings, the cams are drilled with oil passages. Oil holes are located both at the bearings and on the sides of the lobes. These lobes push against tappets which lift the valve stem. A small valve cap, available in a variety of thicknesses to permit adjustment of valve clearance, is interposed between the tappet and the valve stem.

The intake valve guides are flush with the port although on the six cylinder engines they extend into the port. The ports are also highly polished and large enough to keep the engine from suffering from asphyxiation. More about that later.

The hairpin valve springs, two per valve, are all identical, each exerting 150 pounds force on an open valve. Intake valves are open 300 degrees, lift is 0.320 inches and clearance is 0.012. Exhaust valve lift is only 0.300 inch while clearance is 0.020.

The combustion chamber is basically hemispherical. This, combined with the

well-shaped piston crown, gives a very clean, compact chamber. This was the rub. Because of the combustion chamber shape, the size of the intake valve is limited. In order to make the intake valve as large as possible, more space was appropriated by using a 10 mm spark plug instead of the larger 14 mm plug. There was, however, one engine equipped with 14 mm plugs.

But back to the breathing department. The first two engines of this series used Solex carburetors, and though peak power was excellent, performance at lower speeds was erratic. Since then, Weber has produced special carbs known as the 35 IDM, in which the "M" stands for Maserati. These are twin-throat down-draft carbs with a 35 mm bore in which a variety of venturi and jets can be used. For example, use of the largest venturi (35 mm) calls for #130 main jets, #50 pump jets, and #200 air-bleed orifices.

Exhausting the expended charge is accomplished with a typically Maserati layout. What they've done is treat the V-12 as two sixes. Smooth, wide-radius bends combine, in the standard six cylinder pattern, into two groups of three each per side, and then into two pipes which megaphone in front of the rear wheels. In the prototype, these were placed high up alongside the body; the final version had them placed just above the bottom chassis member for more peace and quiet in the cockpit.

After the initial trials, it was determined that exhaust megaphones gave an increase of twenty-five horsepower at the upper end, but low-end performance left room for improvement. For courses such as the Nürburgring, another system is used. The pipe grouping is identical, but instead of terminating into megaphones the twin pipes join into one rather small-bore pipe. This sweeps over the rear suspension and ends near the back of the car. This modification gives far better characteristics at both the mid-revs and at the low end. Thus, exhaust systems are changed from track to track. Quick-change exhaust tuning, anybody?

Both the top and bottom of the clutch housing are extensions of the block and the sump, the latter fitted with cooling vents. The flywheel is sharply dished with internal splining for the multiple-disc clutch. There are two steel driving-discs and a pressure plate that engage three interspersed aluminum driven-discs. The latter are splined to a fabricated hub, which is in turn splined to the clutch shaft. Eight bolts secure the clutch cover plate, with its three withdrawal levers, against nine coil-springs and the flywheel face. The whole assembly is covered by a cast plate with four circular vents and a double bearing support for the clutch shaft. The clutch and the flywheel together weigh twelve pounds.

On the prototype, the propeller shaft took the torque directly to the transmission, which is located in the rear. On the final version, a pair of quick-change step-down gears are interspersed in the drive line just behind the engine. Torque is transmitted aft through a large tubular driveshaft with Hooke-type joints at each end and a sliding spline at the front.

The transmission, the same as that used

with the latest six-cylinder car, is bolted to the frame with six Silentbloc bushings. The two shafts are placed transversely in the car, with the counter shaft being driven by the propeller shaft through a pair of straight-cut bevels. The upper four forward speeds are set by four pairs of constant-mesh spur gears. Gear selection is by a strong dog clutch, one for each ratio, and shifts are made quickly and positively. First gear, a starting-only gear, is overhung inside the right-hand case cover.

Inboard of the incoming bevels is a spur drive from the main shaft to the eight-cam ZF limited-slip differential. There is a wide range of combinations for these spur gears, for the incoming bevels, and for the spur gears housed at the back of the clutch. In all, a very wide choice of overall ratios is available for each gear.

From the differential, the torque goes to Hooke-type joints on each side. One yoke of each is blended into the tubular axle shaft. The deDion tube is also identical to that in the six cylinder car, sweeping forward of the gearbox assembly to join two large-diameter hub assemblies. These have to be big, as they contain the outer pot-type U-joints.

The hubs are located by two parallel trailing arms at each side, the ends of which are rubber bushed. Sideways location of the deDion tube is secured by a square bronze block pivoted at the center of the tube. This block rides up and down between two steel guides bolted to the front face of the differential housing. It was necessary to curve these steel guide plates since the axle must move forward,

because of the trailing arms' geometry, as it moves up or down from its static position.

The transverse leaf spring is located high above the hubs between two wide-spaced pairs of rollers, and is connected to them by forged shackles. These spaced-out rollers increase the roll stiffness without changing the spring rate.

On straight running and coming out of corners, the rear end is very flexible, and will squat under power. While in the corner, the increased roll stiffness permits the tail to break loose easily and controllably for a technique of sliding and drifting that definitely requires the limited-slip differential.

The front suspension is similar to Maserati front ends dating back to 1950, and is identical to that used in the 250F. It is a simple and beautifully-finished wishbone and coil-spring assembly with the top wishbone somewhat shorter than the bottom. A pivoted pad is located on the bottom one, carrying the small-diameter coil spring. This spring surrounds the rubber bump-stops and is anchored to the base of the top wishbone. An anti-roll bar is connected to the bottom wishbone by long, rubber-bushed links. Roll stiffeners may be altered by using different diameter bars. Shocks on the prototype were rotary Houdailles, but the present version features Girling telescopes.

Short, angled kingpins are connected to the wishbone ends by conventional bushings. The forged steering arms run forward

(Continued on page 60)

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Maserati V-12

(Continued from page 59)

and are joined by a four-piece track-rod system to the steering box located in the center.

A robust space-frame of small-section tubes holds the suspension, transmission and propulsion components together. Originally, on the prototype, a heavier tubular space-frame was used. It was found, however, that even with this heavier frame there was evidence of cracking. The latest V-12 uses the same super-lightweight chassis as the 1957 six-cylinder car; with the addition of many welded-in gussets it has proved to be both lighter and stronger.

At Maserati, brakes are constantly subject to experimentation. On the prototype V-12, the entire brake system was lifted directly from the six-cylinder car. It features a radially-finned 14 inch alloy drum with an aluminum shield shrouding its swiss-cheese face to make the fins act as impeller blades. When these proved inadequate, even after modifying the shield to improve air flow, the brakes on the 450S were copied on a slightly-reduced scale. The drums, 16.5 inch front and 14 inch rear, have enormous fins. Very small holes are provided around the periphery to blow out the lining dust. The back of each shoe presents a multi-finned, net-like truss to the heat-dissipating air.

The prototype was built with a really large-radiator opening, similar to the very first 250F in 1954. However, experiments indicated that cooling would be adequate with the smaller-opening of a long-snout front. This was first used on the 250F in 1956 at Monza for improved penetration at high speed, and has proved so successful that it was used throughout 1957. The warm air is ducted out at the bottom of the car.

Fantuzzi, who makes all Maserati competition bodies, is also responsible for the 1957 V-12 GP body. He has been an independent body builder since 1956 (the same year he became associated with Maserati), and he actually rents his space in the Maserati factory from the Orsi brothers. In this model, Fantuzzi utilized the five-degree engine offset to produce a very pleasing design line as the driver sits six inches closer to the ground than he did in the gawky-looking prototype.

How good is the car? Well, if Fangio signs with Maserati again, that should give us a pretty good clue.

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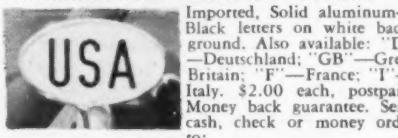


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Fabulous Vauxhalls

(Continued from page 43)

another occasion and in a different place, Mays broke a crankshaft at 6000 rpm, this being perhaps the only authenticated instance of fragments from a decimated engine landing in two different counties. (It's a pity to have to admit the car was practically straddling the county border at the time.)

The T.T. Vauxhall's four-speed gearbox, as well as the cylinder/crankcase block, was an aluminum alloy casting, a factor helping to keep the dry weight of an unmodified car down to the moderate figure of 2464 pounds. One of many eye-opening chassis features was a rather complex braking system in which the normal pedal applied the front stoppers; a big hand-lever acted on the back wheels alone; and a little trigger on the steering post routed compressed air to all four pairs of shoes. Source of the breath for this servo system (of Westinghouse make) was a pump operated off the camshaft drive train.

The theory was that in situations where the driver's hands, feet and eyebrows were fully occupied with other manipulative functions, he could just flick the trigger to *on* and leave it there until momentum was sufficiently spent. Or, in a pinch, he could delegate the Westinghouse fingerwork to his riding mechanic.

It somewhat oversimplifies the conception and birth of the lovely 30/98 sports car to say that "it came into existence by accident." Pomeroy himself provides the key to the enigma by adding that "it was never planned for production." True, it wasn't.

A fellow named Joseph Higginson, inventor of the Autovac, was, at the beginning of the century's second decade, enjoying enviable successes as an amateur driver in English hillclimbs. But Joe had his frustrations, too, the chief of them being his recurrent failure to undercut the course record for Shelsley Walsh. Then as now, this was the blue ribbon of the hillclimb game in Britain. And the simple fact was that Higginson's huge and cumbersome 80 horsepower La Buire didn't have what Shelsley took. He therefore paid a series of calls on the best brains in the country's automobile industry, quill and checkbook in hand, offering large sums for a car that would help him realize the ambition of a lifetime. The only taker was Laurence Pomeroy *Ainé* of Vauxhall, who, because Joseph hadn't given him enough time to start from scratch and create something entirely new, took the logical course of extracting some extra poop from the best of his extant designs, the Prince Henry model.

In the few months that were available, Pomeroy executed a masterly hopup, boring and stroking the 95 by 1400 mm P.H. job to the new dimensions of 98 by 150, and also adding other engine touches of a more subtle character. That was early in 1913. Well, the recipe worked. Higginson, at his

(Continued on page 62)



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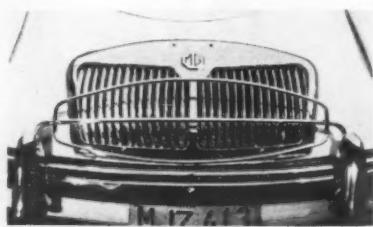
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The Fabulous Vauxhalls

(Continued from page 61)

very first Shelsley Walsh appearance on a Vauxhall, set a record that was to survive until 1921, although the postwar climbs there were resumed in 1920.

Enchanted with the results of Pomeroy's cuisine, Vauxhall forthwith built two more 30/98s in the approximate image of Joe's, turning one of them over to the company's managing director, P. C. Kidner, and the other to their established professional race driver, A. J. Hancock. These cars were immediately successful in speedwork and, before anyone quite knew what was happening, the model had crystallized into a limited-numbers production type.

In keeping with its almost haphazard entry into the world was the fact that even the people most closely concerned with the 30/98 were never exactly sure how the car came by its designation. It was then, and remained for years afterwards, a favorite nomenclatural practice in Britain to make up type numbers out of two sets of numerals with an oblique between them, the prefix denoting the nominal horsepower under the English fiscal system, and the suffix the output in bhp, real or fictitious. But the 30/98 never was fiscally rated at 30, and it never developed 98 on the dynamometer. One theory is the engine developed 30 bhp at 1000 rpm and that the 98 referred to the bore measurement. But presently the Vauxhall company is not dogmatic on the point, allowing that anybody's guess is as good as anybody else's, and possibly better.

Superficial scrutiny, or even a much closer study, fails to reveal even a few obvious reasons why the original L-head 30/98, known as the E Type and displacing 4526 cc, produced more power than contemporaries of comparable capacity, and did so with such smoothness and lack of effort. It just did, that's all—in common with all the creations of chief engineer Laurence H. Pomeroy. Basically the prescription was straightforward enough: side valves, a five bearing crank, fixed cylinder head, single riser carb, iron pistons, a compression ratio that presumably wasn't higher than 5 to 1, a chain-driven cam-shaft with the sprockets at the front. Nevertheless, this unpretentious movement churned an honest 90 bhp at 2800 rpm, giving the car a top speed of around 85 miles per hour when fitted with what became the classic 30/98 body—an open sports four-seater of trim and slender shape, known as the Velox. (This name has been re-exhumed at various junctures of the GMC reign, and is of course in current use for one of the '57 sedans).

Pomeroy's handiwork in 1913, like Ricardo's nine years later, certainly showed a shrewd appreciation of the importance of good cylinder filling and structural rigidity. His cams for the E Type engine gave a higher lift than was probably to be found on any other non-racing mill of the period, while incidentally, his valve clearances, at .050 and .060 in. for intake and exhaust respectively, were truly jumbo voids.

Something else in common between the

brain progeny of Pomeroy and Ricardo was their responsiveness to advanced tuning and development. The E Type 30/98, which was promoted to full production status after the first World War, won countless speed events in Britain and abroad during the '20s. What power output was eventually achieved isn't easy to say, but it's a fair guess that the single seated E that lapped Brookland at 108 mph must have jerked the dynamometer well into three figures. They were stayers, too, these E Types. Running over atrocious roads, one heavily-crewed example averaged a record breaking 40 mph from Durban to Pretoria. Earlier, one of the half-dozen Es turned out before WWI had had the memorable distinction of placing second in the 1914 Russian Grand Prix at 70.8 mph mean. What this race was, or where it happened, is obscure, for not even Monkhouse's encyclopaedic *Grand Prix Facts and Figures* wots of it.

Although there are fewer 30/98s than vintage Bentleys in captivity, these classic Vauxhalls are at least as eagerly sought after and reverently preserved by connoisseurs the world over. Needless to say, the relative virtues and potencies of the 30/98 and the unblown 4 1/2 Bentley are argued and reargued with a fervor that induces suicidal boredom in nonpartisans. In vintage competitions of the present day, sometimes one will win, sometimes the other. But anyway, the results prove little or nothing about the original merits of the two designs, because examples now surviving are all practically certain to have benefitted from injections of modern technical knowledge and lavish financial outlay.

Incidentally, it won't have escaped the notice of the American devotees of the classic automobile that two Vauxhalls, a 1914 Prince Henry and a 1920 30/98, were among the eight cars chosen to represent Britain in the second Anglo-U.S. Vintage Rally, run over a test-punctuated course in the states of New York, New Jersey, Pennsylvania, Connecticut and Massachusetts in April of 1957. The 30/98 made fastest time, irrespective of displacement or nationality, in a speed hillclimb over the 2.5 mile Duryea Drive course at Reading, Penn., and also won the standing quarter-mile sprint with a time of 19.9 seconds. Anything under 20 seconds for a standing quarter by a 35 year old L-header is not to be despised, no matter what loving care has been bestowed on it.

30/98s fall into two subtypes—the side-valve E model and the OE with pushrod overhead valves. The latter, still with a 98 mm bore but its stroke reduced to 140, was launched early in 1923 and gave 112 bhp at the increased crank speed of 3500 rpm. Regular OEs, curiously enough, were little if any faster than the L-headed son of a German prince, presumably due to the slight gains in weight and girth that accompanied the switch to ohv. On the other hand, the pushrodder brought real improvements in flexibility throughout the speed range and would throttle back to 6 mph on its 3.3 to 1 top gear without snatch with a full four-person crew aboard.

At birth, the OE was braked on the back wheels only, same as the E Type had been, but front brakes, featuring heavily ribbed drums of imposing measurements, were

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added in the fall of '23. A later development was the introduction in 1926 of a counterbalanced crankshaft, superseding what was disrespectfully known as the "bent wire" crank. This, by moving the safe rpm limit up the scale, much increased the scope for hopups.

From the dates quoted here it will be apparent that GMC, to their credit, did not immediately junk the 30/98 on taking over at the Vauxhall plant, sited at Luton, Bedfordshire, in 1925. Indeed, although the Detroit influence foreshadowed Vauxhall's erasure of the sports car from their catalog, the finishing touches were put to the OE by engineers working under GMC orders. These included the conversion of the brakes to hydraulic operation in 1927—the 30/98's last year in production—and the redesigning of the fuel filler orifice to cure it of its notorious habit of regurgitating about half of its intended intake onto the ground.

It needs more than a respectable specific output, or even a vigorous power-weight ratio, to make a great car, of course, and the 30/98 possessed the necessary additional prerequisites of greatness. It was superbly made from the finest materials. The general roadability, with the possible exception of the earliest OE, which was a mite short in the wheelbase and therefore had a tendency to skid in the wet, was of the highest order. The layout of all the engineering elements was neat, orderly and accessible to a degree that even Bentley couldn't surpass. Every car was exhaustively and expensively tested before leaving Luton: engines were run for impressive durations on the bench, then the cars were placed on a roller rig and operated in all gears in turn under conditions simulating street work. Finally there was a normal roadtest routine.

Well might the *Motor* remark, in reports published in 1919 and '20, that the 30/98 was "a car containing all the essentials of a racing model without the usual accompaniment of harshness and excessive noise"; and that it represented "a new conception of what the sportsman's motor car should be."

The external hallmark of Luton was always the distinctive fluted gouging tapering rearwards from the radiator shell into the hood shoulders. These flutes originated back before WWI, and are still reproduced in vestigial form today. Bodywork for the 30/98s was meticulously made and finished, the paint jobs being individually blanketed in airstreams from multiple ovens permitting precise control of temperature and humidity. In general, the design of the Vauxhall bodies of yester-year did not show any daring originality, though there was one exception: in collaboration with the Earl of Ranfurly, who apparently couldn't quite bring himself to say adieu to the era of horsedrawn transportation, Vauxhall once built a number of motorised hansom, thereby setting a record for driving seat altitude in automobiles. These vertiginous buggies were not a commercial success and died a quick death.

The Vauxhall Iron Works Company Limited first went into business as car manufacturers in 1903, but the marque's

(Continued on page 64)

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Riverside Opener

(Continued from page 45)

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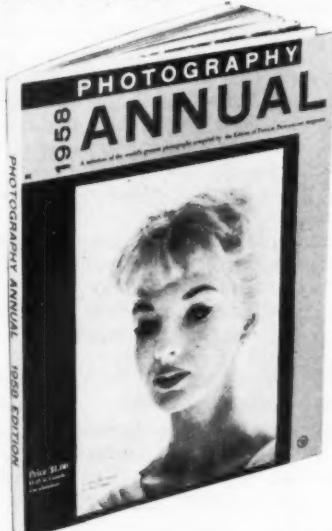
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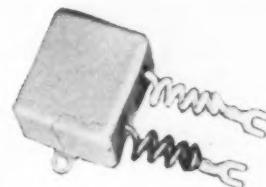
As the enthusiastic crowd carried the Mexican youth from the victory circle on its shoulders, Ginther, main event winner, commented, "His maturity is absolutely fantastic. Pressure doesn't seem to mean a thing to him and he's never flustered." Ak Miller, of Mexican Road Race fame, added, "I think he was just playing with those other guys."

Though the race for production cars over 2000 cc didn't stir the same excitement, Dan Gurney proved to be the class of the field as he scored one for Detroit by wheeling a Corvette to a 29 second win over the Mercedes Benz driven by Jack Bates. John Columbo, in another Mercedes, was third.

Winner in the event for production cars under 2000 cc was, to no one's great surprise, an AC Bristol, this time driven by Bill Love. Spectators' accolades, however, went to Al Cadorrobi, who consistently threw his Porsche Gran Turismo through turns sideways and did everything but sprout wings in a vain attempt to overhaul the leader. Third was Gordon Crowder in

(Continued on page 66)

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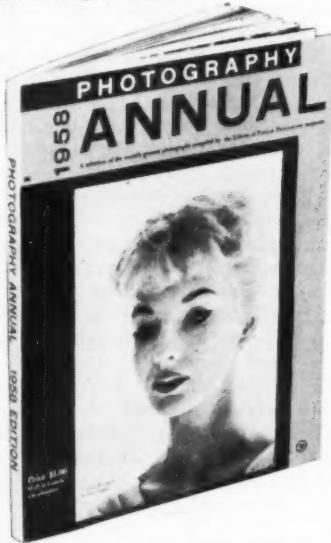
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On Sunday, Rodriguez led all the way, finishing 13 seconds ahead of Jean Pierre Kunstle and 70 seconds ahead of Joe Playan, both in Porsche Spyders. Ken Miles, who had beaten Rodriguez at Puebla, Mexico in May when the youngster debuted the German racer, did not compete. Car owner John von Neumann was in Europe and decreed his cars should be inactive during his absence.

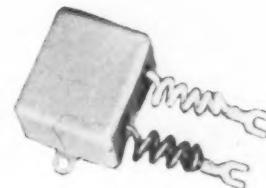
As the enthusiastic crowd carried the Mexican youth from the victory circle on its shoulders, Ginther, main event winner, commented, "His maturity is absolutely fantastic. Pressure doesn't seem to mean a thing to him and he's never flustered." Ak Miller, of Mexican Road Race fame, added, "I think he was just playing with those other guys."

Though the race for production cars over 2000 cc didn't stir the same excitement, Dan Gurney proved to be the class of the field as he scored one for Detroit by wheeling a Corvette to a 29 second win over the Mercedes Benz driven by Jack Bates. John Columbo, in another Mercedes, was third.

Winner in the event for production cars under 2000 cc was, to no one's great surprise, an AC Bristol, this time driven by Bill Love. Spectators' accolades, however, went to Al Cadrobbi, who consistently threw his Porsche Gran Turismo through turns sideways and did everything but sprout wings in a vain attempt to overhaul the leader. Third was Gordon Crowder in

(Continued on page 66)

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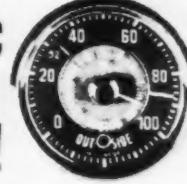
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(Continued from page 65)

another AC Bristol.

For the first time since Ruth Levy moved into West Coast competition, a full-bore hassle developed for first spot in the women's event. After a hub to hub battle for the full eight laps, Levy squeezed her Porsche across the line first, fending off a last ditch bid from the Aston Martin driven by Mary Davis, the Mobilgas Economy Run winner. Third was Linda Scott in an AC Bristol.

Winner of the opening event of the day was John Lumkin in an MGA, finishing ahead of Bruce Turner and Skip Vandagriff in similar cars.

The crowd-chaser, for modified cars under 1100 cc and Formula II cars, was won by Walker Edmiston in his Fiat/Crosley. The Formula II clash was more of an exhibition than a race with Bill Pollack in Lance Reventlow's Cooper being the only driver to get any performance from his mount. The other two entrants were still in the tuning stage.

In what proved to be an exciting if perplexing race from the spectators' stand-

point, top motorcycle award went to George Pena on a Norton 99. He was followed by Bud Parrott, Triumph mounted, and the Norton Manx wheeled by George Ellis. Because of an entry of only 31 bikes, all classes were run together, causing confusion among the predominantly sports car-minded crowd.

Although the anticipated 100 mph speeds were never in any serious danger of being reached, Ginther did average better than 85 mph in winning the main event and took honors for the top speed of the day, hitting 150.5 mph through the traps. Rodriguez averaged less than a mile an hour slower in winning the small car event, although his top speed was only 137.1 mph. Some 70 men and 6 women topped the 100 mph mark.

Future plans for the Raceway are based on six major races and numerous club events each year. By the time this reaches print, it will have been the site of a nationally sanctioned drag meet, a NASCAR backed stock car race and, possibly, a Sports Car Club of America national event. Despite a certain reluctance to talk about it, it was learned that track officials have also made overtures to European factories concerning the possibility of a major international event early next season.

—Jim Mourning

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